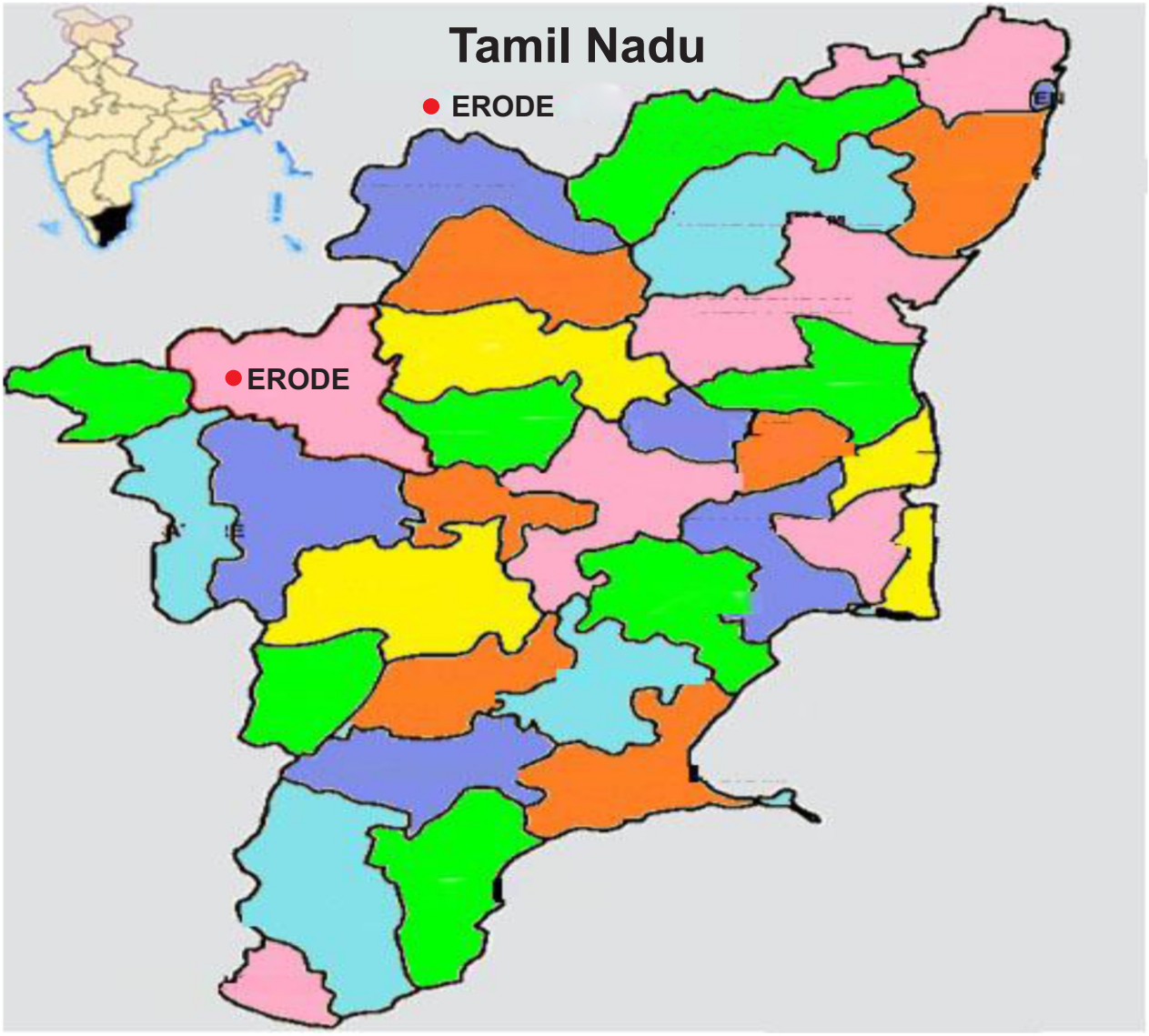
EVALUATION OF CEPI SCORE & ACTION PLAN FOR CEPI AREA OF ERODE INDUSTRIAL CLUSTER, ERODE DISTRICT



SUBMITTED

JANUARY 2020

TAMILNADU POLLUTION CONTROL BOARD

CONTENT

Executive Summary

The study has been conducted for monitoring the Erode CEPI area, Erode District, Tamil Nadu for Ambient Air Quality (AAQ), Surface Water and Ground Water and for the calculation of revised CEPI score. The sampling locations for surface water, ground water and air monitoring were finalized by TNPCB based on previous CEPI monitoring points. During 2018 the CPCB has conducted air monitoring survey at 8 locations out of which 4 locations are 6-10 Km away from the Erode CEPI core area. Hence those far away locations are not included instead four new locations are identified within CEPI core/ impact area to cover entire industries upwind, downwind and cross wind directions. Similarly, seven surface water sampling locations were identified by the CPCB during 2018 in which three locations were 6-10 Km away from CEPI core area. Hence three new locations are identified for surface water sampling within CEPI core area. During 2018, the ground water samples were collected from nine locations in which 5 locations are located 6-10 Km away from Erode CEPI core area. So, additional six ground water sampling locations are fixed in CEPI core and impact zone for analysing the quality during 2019. The sampling and analysis were carried out as per CPCB/EPA/APHA/IS/ASTM standard methods.

Based on the sampling and analysis results for air, surface water and ground water, the CEPI score is evaluated as per the concept of Comprehensive Environmental Pollution Index (CEPI) as evolved by Central Pollution Control Board (CPCB) during 2016.

From the study conducted during 2018 by the CPCB the CEPI score for Erode CEPI area as per the revised guidelines is 60.33 (Air- 34.12 , Water- 47, Land – 52.75 i.e., An- Wn-Lc). The TNPCB has taken various measures during 2018-19 & 2019-20 for the effective implementation of Zero Liquid Discharge system, biomining of MSW legacy waste, Micro composting activities at 19 locations, incineration of MSW non biodegradable waste, treatment of part of domestic sewage through the existing Corporation STP has improved the environmental quality. Further, the proposed four Common Effluent Treatment plants for the existing textile dyeing and bleaching industries with adequate individual effluent treatment plants (after the formation of the CETPs, the IETPs will be closed) and the proposed solar energy plants for the CETPs will reduce the burden on the environment and the CEPI score will considerably reduced to the expected level of 25.02.

CHAPTER - 1

INTRODUCTION

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INTRODUCTION

1.1 CEPI Area Boundary Details

1.1.1 General Introduction

Industrial pollution is the contamination of the environment by businesses, particularly plants and factories that dump their waste products into the land, air and water. Industrial waste is one of the largest contributors to the global pollution problem endangering people and the environment. The Central Pollution Control Board (CPCB) has developed a Comprehensive Environmental Pollution Index (CEPI). The main objective of the study is to identify polluted industrial clusters or areas in order to take concerted action and to centrally monitor them at the national level to improve the current status of their environmental components such as air and water quality data, ecological damage, and visual environmental conditions.

The concept of Comprehensive Environmental Pollution Index (CEPI) was evolved by Central Pollution Control Board (CPCB) during 2009-10. CEPI is a rational number between 0 and 100, assigned to a given location to characterize the environmental quality by following the algorithm of source, pathway and receptor. During 2009-10, 88 industrial clusters were notified as polluted industrial areas (PIA). Subsequently, based on the study conducted by the CPCB in the year 2017-18, the number of identified Polluted Industrial Clusters went up to 100. The said number includes 38 critically polluted, 31 severely polluted and remaining 31 as other Polluted Areas.

1.1.2 Erode CEPI Area

Erode is classified as one of the severely polluted areas (SPA). Erode is a city and seventh largest urban agglomeration in Tamil Nadu. It serves as an administrative head quarters of Erode District. Agriculture and Industrial activities coexist in Erode District. Erode City Municipal Corporation covers an area of 109.52 sq.km with a population of 4.98 lakhs.

The Corporation consists of Erode, Suriyampalayam, Gangapuram, B.P Agraharam, S.P Agraharam, Vairapalayam, Vendipalayam, Kasipalayam (Part), Villarasampatti, Periya Semur, Veerappanchatram Villages. The Corporation has been divided into 60electoral wards and 15 sanitary divisions.

The CEPI core area covers about **45.25 sq.km** within the Corporation area. Most of the CEPI core area is urbanized. As the River Cauvery, Kalingarayan canal flows in the CEPI impact area, the main activities carried out in these areas are agriculture. A portion of Lower Bhavani Project (LBP) Ayacut area also falls within the CEPI core area. The industrial activities such as textile processing, tannery etc., are also carried out predominantly within the CEPI area.

1.1.3 CEPI Location

The PIA lies between latitudes 11°16'0" N & 11°25'0" N and longitudes 77°39'0" & 77°45'0" E (Map enclosed).

Table 1.1 Boundaries of core zone in the Erode Severely polluted Area (SPA) in terms of Geographical Co-ordinates

Sl. No.	Reference Point	Geographical Co-ordinates
1.	East (Near M/s.SCM Textile Processing Mills (P) Ltd., Karungalpalayam)	11º 21' 13.57" N 77º 44' 29.68" E
2.	South East (Near M/s.Vignesh Process, Vendipalayam)	11º 19' 58.87"N 77º 44' 50.74"E
3.	South (Near Railway Gate-II, Vendipalayam)	11º 19' 43.01"N 77º 44' 40.06"E
4.	South West (Near M/s.Siva Narayana Printing Mills, Kollampalayam)	11º 19' 15.71"N 77º 43' 43.36"E
5.	West (Near Villarasampatti Nall Road, Nasiyanoor Road)	11º 20' 12.28"N 77º 40' 27.88"E
6.	North West (Near M/s.Madhan Dyeing, Chithode)	11º 23' 26.41"N 77º 39' 31.07"E
7.	North (Near M/s.The Yahood Bleachers, Suriyampalayam)	11º 25' 5.32"N 77º 40' 46.22"E
8.	North East (Near M/s.Pioneer Processing India – A Division of Jansons Industries Ltd.,)	11º 23' 56.20"N 77º 41' 38.55"E

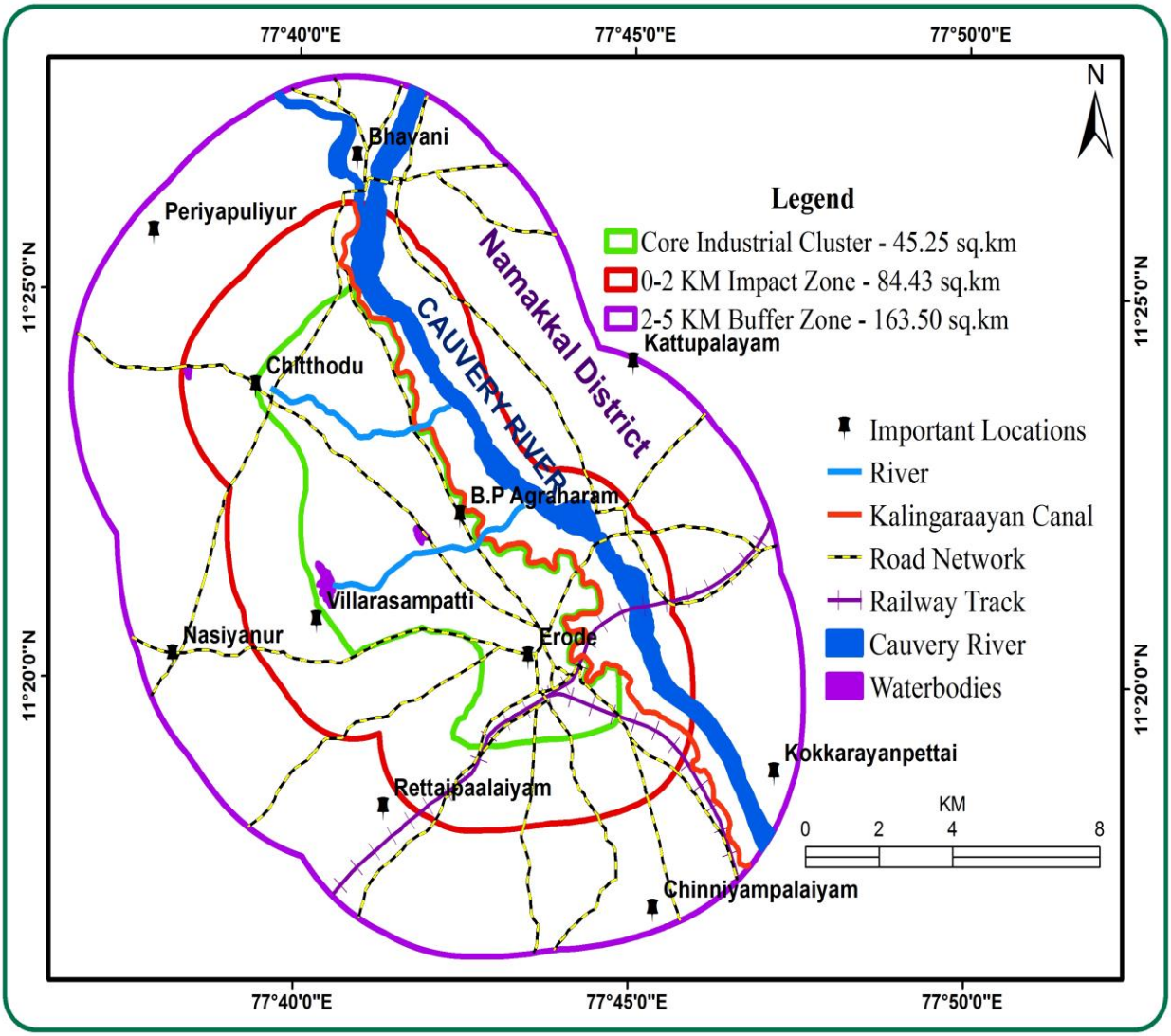
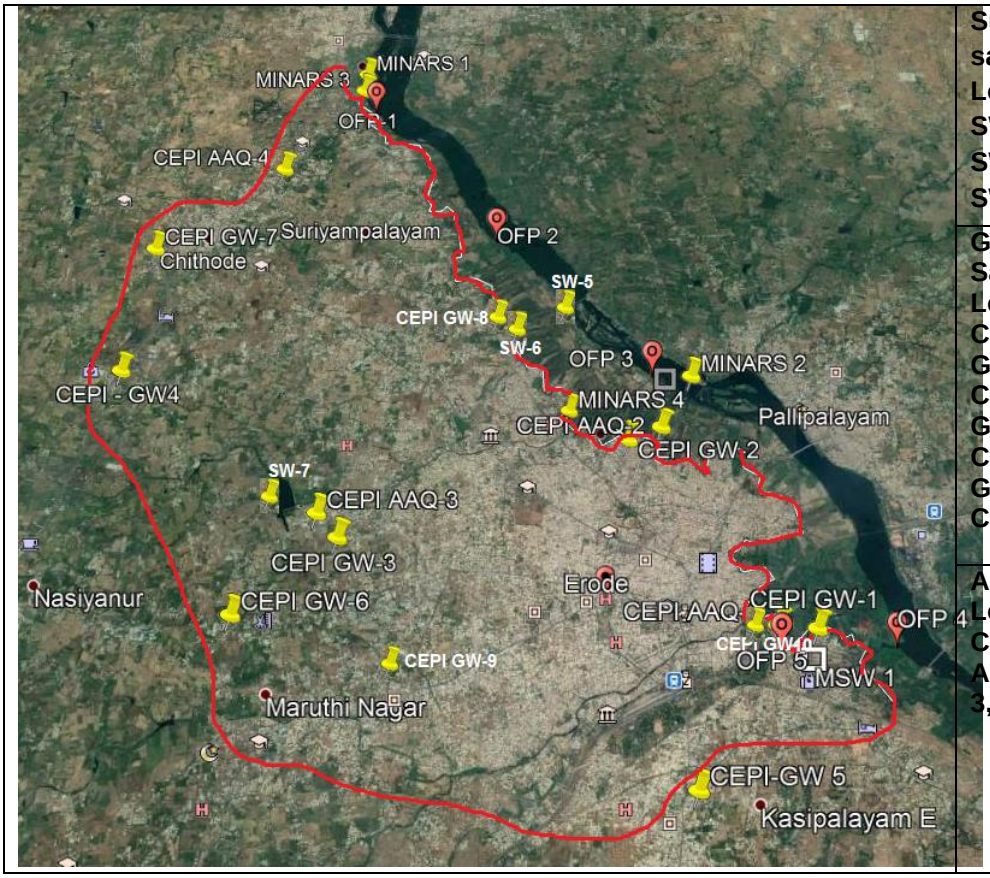


Fig - 1.1 Digital map showing Erode CEPI core area, impact area and buffer zone



Surface water sampling Locations: SW-1, SW-2, SW-3, SW-4, SW-5, SW -6, SW-7
Groundwater Sampling Locations: CEPI GW-1, CEPI GW-2, CEPI GW-3, CEPI GW-4, CEPI GW-5, CEPI GW-6, CEPI GW-7, CEPI GW-8, CEPI GW-9, CEPI GW-10
AAQ sampling Locations: CEPI AAQ-1, CEPI AAQ-2, CEPI AAQ-3, CEPI AAQ-4

Fig-1.2 Google Earth Map with Locations of Surface Water Sampling, Groundwater Sampling & AAQ Survey

1.2 Habitation Details in Erode CEPI Area

The CEPI core area of Erode is mostly urbanized and forms a part of Erode Municipal City Corporation.

1.2.1 Total Population and Sensitive Receptors

Erode City Municipal Corporation covers an area of 109.52 sq.km with a population of 4.98 lakhs. The CEPI core area of 45.25 sq.km lies within the City municipal Corporation limits. The population within the CEPI core area is around 3 lakhs. The villages located in the CEPI core area are detailed as below,

Table -1.2 List of Villages in CEPI Core Area

Sl. No.	Name of the Villages
1.	Vendipalayam
2.	Vairapalayam
3.	B.P Agraharam
4.	Gangapuram
5.	Suriyampalayam

6.	Veerappanchatram
7.	S.P Agraharam
8.	Villarasampatti
9.	Periya Semur

Table -1.3 Population of Erode City Municipal Corporation Area

Year	Population
1991	1,59,232
2001	1,51,274
2011	4,98,121

The Erode Town was functioning as a special grade Municipality from the year 1980 and upgraded as Corporation from 01.01.2008.

1.2.2 Details of the HealthCare Facilities in CEPI Area

Table -1.4 List of Major Hospitals in CEPI Area

Sl.No.	Name of the Hospital	Address
1.	M/s. Sudha Hospitals	162-181, Perundurai Road, Erode
2.	M/s. Lotus Hospital	Poondurai Road, Moolapalayam, Erode

Total consented/ Authorised Health care facilities (HCFs) (bedded and non bedded) within the CEPI core area are 328 nos. The total quantity of biomedical waste generated by these health care facilities are 215 Kg/day. All the biomedical wastes are collected on daily basis and disposed through the common biomedical waste disposal facility operated by M/s Ramky Enviro and Energy Systems, Edapadi Taluk, Salem District.

Table -1.5 Educational Institutions Located in CEPI Area

Sl.No.	Name of the Area	Number of educational institutions
1.	Thindal	14
2.	Kasipalayam	3
3.	Vairapalayam	4
4.	B.P Agraharam	3

1.3 Eco-Geological features in and around CEPI Area

There are no sensitive eco-geological features within 5 km radius from the Erode CEPI core area.

1.3.1 Major Water Bodies

River Cauvery flows on the north eastern side of the CEPI core, impact and buffer area and traverses to a distance of about 12 km on the northern side of the CEPI core area. The river flows at a distance of 50m to 500m from the CEPI core area. Apart from irrigating delta districts, it caters the drinking water needs of Erode District etc.,

The Kalingarayan canal forms the north eastern boundary of core CEPI area in Erode and flows to a distance of 15.5 km forming the northeastern boundary of the identified CEPI core area.

The other water streams such as Notchipallam, Naripallam, Sunnambu Odai, Pitchaikaranpallam and Perumpallam flows within the CEPI core area and reaches River Cauvery. The untreated sewage from the Erode Corporation area is discharged into the above said streams reaches River Cauvery. Konavaikkal stream flows from the Corporation area to Kalingarayan canal.

The water bodies such as River Cauvery and Kalingarayan canal are periodically monitored by the Board. Water samples are collected every month from River Cauvery at the upstream side of Erode town i.e at R.N Pudhur (at 1km downstream of Bhavani river and Cauvery river Confluence point) and at the downstream side ie., at Vairapalaym under MINARS sampling program. Similarly, monthly samples are collected from Kalingarayan canal at R.N Pudhur and at B.P Agraharam.

Online continuous water quality monitoring system are established at three locations in Kalingarayan canal at the upstream side of Erode town i.e at R.N Pudhur (behind M/s Pioneer Processing India), at S.P Agraharam (behind M/s India Dyeing Mills Pvt Ltd.,) and at Karungalpalayam (behind M/s SCM Textile Processing Mills). At present all the three online monitoring stations are not in operation. In addition, online

water quality monitoring station is also provided at Parisalthurai in Cauvery River at the downstream of the CEPI core area.

1.3.2 Ecological parks, Sanctuaries or Eco Sensitive Zones

No ecological parks, sanctuaries or eco sensitive zones are located within 5 km radius from the Erode CEPI core area.

1.3.3 Monuments of Historical/Archaeological/Religious Importance

No Monuments of Historical/archaeological/religious importance are located within 1 km radius from the CEPI core area

1.4. Industries Details in CEPI Area

The industries classification and distribution within the CEPI area are as below:

Table – 1.6 No. of Industries in CEPI core area

Category	Total no. of industries
Red – Large	7
Red – Medium	2
Red – Small	589
Orange – Large	6
Orange – Medium	2
Orange – Small	243
Total	**849**

1.4.1. Grossly polluting industries

Grossly polluting industries are not located within the CEPI core area.

1.4.2 Improvement of Environmental Quality in Erode CEPI Area due to Stoppage of industries

The power supply connections of 36 consented industries (Textile processing and tanneries) are disconnected through the District Co-ordination Committee, Erode within the CEPI core area based on the surprise inspection carried out.

In addition, the following industries have permanently stopped operation within the CEPI core area between 2017 & 2019.

Table – 1.7 List of units closed in CEPI area

Sl. No.	Name of the industry & Address of the unit	Category	Date & Year of stoppage
1.	M/s Soundar Raja Printers, Erode M Bit 1 Village, Erode Taluk & District.	Red Small	23.10.2017
2.	M/s ABR Printing Mills, 46, EB Colony, Kovalan Street, Teachers Colony, Erode.	Red Small	05.12.2017
3.	M/s Suhia Polymers, Veerappanchatram, Erode.	Orange Small	19.03.2018
4.	M/s Nani Agro Products, Vivekanandhar Salai, Narayanavalasu, Erode	Orange Small	20.03.2018
5.	M/s Anoha Foam Pvt Ltd, Ellapalayam, Periya Semur, Erode.	Orange Small	20.03.2018
6.	M/s Anamalais Agencies, Ashokapuram, Bhavani Main Road, Erode.	Orange Small	20.03.2018
7.	M/s SPN Printers, Tower Line Colony, Narayanavalasu, Erode.	Red Small	21.03.2018
8.	M/s J.P Screen printers, 148, Perundurai Road, Erode.	Red Small	05.04.2018
9.	M/s G.B Raja Top Weaving Pvt Ltd., Gangapuram, Erode.	Green Small	31.03.2018
10.	M/s Sree Sivasankara Processing, Gangapuram, Erode.	Red Small	25.04.2018
11.	M/s Sri Balaji Processors, Periya Semur Village, Erode.	Red Small	18.05.2019
12.	M/s Annamar Granites, Bhavani Main Road, RN Pudhur, Erode.	Orange Small	31.08.2018
13.	M/s S.V Yarn Dyeing, Surampatti, Erode.	Red Small	12.12.2018
14.	M/s Classic Dyeing, Sangu Nagar, Surampatti, Erode.	Red Small	12.12.2018

15.	M/s Rainbow Textile Processors, Sangu Nagar, Surampatti, Erode.	Red Small	12.12.2018
16.	M/s Brindhavan Textiles, Agilmedu 4th Street, Erode.	Red Small	12.12.2018
17.	M/s Sentil hospital, Municipal Colony, Erode	Orange Small	02.01.2019
18.	M/s The Nilgiri Dairy Farm, Vendiapalayam, Erode	Red Small	02.01.2019
19.	M/s G.V Granites, Suriyampalayam Village,Erode.	Orange Small	14.01.2019
20.	M/s Thangam Traders, KNK Road, Karungalapalayam, Erode.	Orange Small	07.01.2019
21.	M/s Samunda Plastics, Railway Colony, Kasipalayam.	Green Small	02.01.2019
22.	M/s LKM Hospitals, Surampatti Naal Road, Erode.	Orange Small	02.01.2019
23.	M/s Jio Polymers, Koluthupalayam, Gangapuram, Erode	Green Small	05.04.2019
24.	M/s Sivasakthi Dyeing, Veerappanchatram, Erode.	Red Small	09.04.2019
25.	M/s Vajra Poly & PVC India Pvt Ltd., Villarasampatti, Erode.	Green Small	19.07.2017
26.	M/s Dhamu Sree Tex Mills, Thaneerpandalpalayam, Erode.	Green Small	19.07.2017
27.	M/s Subramaniam Textile and Processing Mills, Periya Semur Village, Erode.	Red Small	19.07.2017
28.	M/s Sri Thirumala Textile Processing, Seenankadu, Erode.	Red Small	19.07.2017
29.	M/s Arthanareswarar printers, Gangapuram, Erode.	Red Small	11.01.2019
30.	M/s Arunagiri bhagavan Process, Gangapuram, Erode.	Red Small	11.01.2019

31.	M/S Krishna Processing, Gengapuram, Erode.	Red Small	22.04.2019
32.	M/s Golden Colours, Gangapuram, Erode	Red Small	22.04.2019
33.	M/s Sri Amman Tex, Gangapuram, Erode	Red Small	03.03.2018
34.	M/s Sathosh Bleaching Company, Gangapuram, Erode.	Red Small	22.04.2019
35.	M/s Saravana Tex Private Ltd., Gangapuram, Erode.	Red Small	30.04.2019
36.	M/s Sri Krishna Bleachers, Konkampalayam, Erode	Red Small	30.04.2019
37.	Sri Balaji Processing Mills, Karuvilparaivalasu, Erode.	Red Small	28.09.2016
38.	M/s Vel Murugan Textile Bleaching, Kasipalayam, Erode.	Red Small	19.07.2019
39.	M/s Tamilnadu Kidney Centre, Erode.	Orange Small	31.07.2019
40.	M/s Sankari Bleaching, Vairapalayam, Erode.	Red Small	08.11.2019

As the above mentioned list of industries which were within the CEPI area have closed their activities during 2017,2018 & 2019, the pollution load due the above industries has been reduced and has improved the environmental quality within the identified CEPI area.

1.5 Green Belt Development Details in CEPI Area

The details of green belt development in major industries are given below

Table 1.8 Details of Green Belt Developments

Sl. No	Name of the industry	Green Belt Area in Ha
1	M/s India Dyeing Mills P Ltd.,	1.31
2.	M/s. S P Textile Processors Pvt Ltd,	0.3
3.	M/s.SCM Textile Processing Mills Pvt Ltd.,	1.0
4.	M/s. The Tamil Nadu Co-operative Processing Mills Ltd.,	0.20
5.	M/s. Pioneer Processing India, (A Division of Jansons Industries Ltd)	0.65
6.	M/s. Shiny Processing Mills Private Limited	0.20

1.6 CEPI Score declared by CPCB (for 2017-18)

	Air	Water	Land	CEPI Score	Status of Environment
Erode (Tamil Nadu)	34.12	47	52.75	60.33	An-Wn-Ls

As per the CEPI score Erode is classified as Severely Polluted Area (SPA).

CHAPTER - 2

AIR ENVIRONMENT

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2.1 Primary and Secondary Pollutants Considered for Air EPI

The primary pollutant considered for calculating the Air EPI in Erode CEPI area is $PM_{10.}$ The secondary pollutants considered for calculating the Air EPI is $PM_{2.5}$ and NO_2. The CEPI score for the air quality during 2018 is 34.12 which indicates that the air quality is within the permissible limits.

2.2 Air Quality Sampling Locations in CEPI Area

The sampling points identified for analyzing Ambient Air quality (Map enclosed).

Table 2.1 Locations of AAQ sampling points in CEPI area

Sl.No.	Location	Latitude	Longitude
AAQ-1	Sri Vignesh Building (H.No.93/A, Old Karur PWD Office), Konavaikkal	N 11°20'23''	E077°44'18''
AAQ-2	Manjula Bleaching Factory-On Top of Admin Office	N 11°21'42''	E077°43'26''
AAQ-3	Karuvin Parai Valsu (H.No.35/A-Villarasan Post)	N 11°20'58''	E077°40'43''
AAQ-4	Chithodu(H.No.6,Thirupathi Thottam,Thattan Kuttai Medu,Rayapalayam Pudur)	N 11°23'56''	E077°40'05''
AAQ-5	R.N Pudhur (Additonal point)	N 11°23'56''	E077°42'05''
AAQ-6	Moolapalayam (Additonal point)	N 11°19'15''	E077°44'01''
AAQ-7	Gangapuram (Additonal point)	N 11°21'38''	E077°40'21''
AAQ-8	Thindal (Additonal point)	N 11°19'10''	E077°40'26''

The Air quality in Erode CEPI area is within the desirable levels. The existing air pollution control devices provided in the industries will be monitored on regular basis for maintaining the air quality in CEPI area within the desirable levels.

AAQ samples:

CEPI AAQ-1-Vendipalayam

CEPI AAQ-2-Vairapalayam

CEPI AAQ-3-Karuvilparai – valasu

CEPI AAQ-4-Chitthode

Fig.2.1 Map showing the AAQ sampling locations in Erode CEPI area

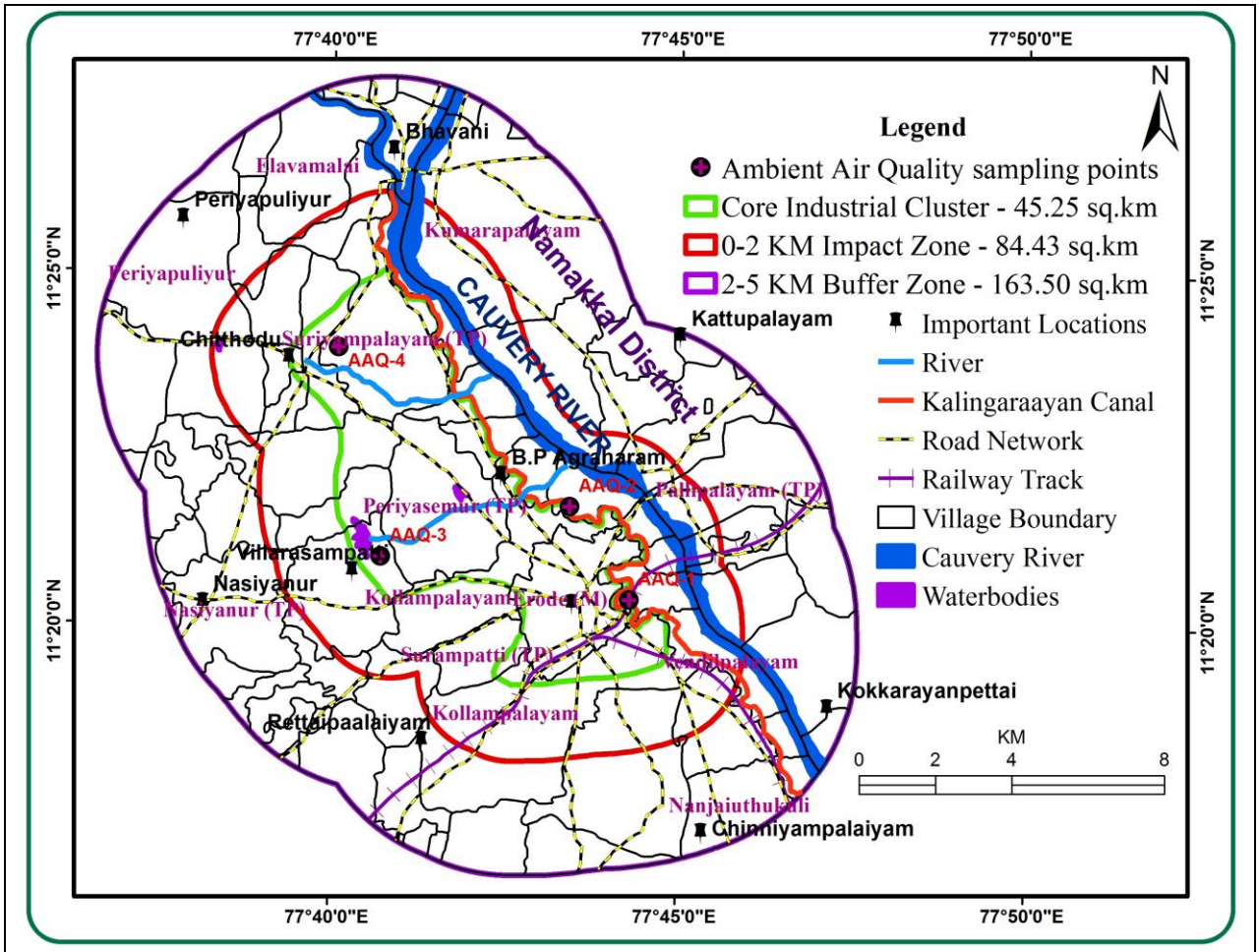


Fig. 2.2 Digital map showing the location of AAQ sampling points in Erode CEPI area

2.3 Status of Ambient Air Quality in 2018 in CEPI Area

The status of the Ambient Air Quality in Erode CEPI area during the survey conducted in February 2018 is as below.

Table 2.2 AAQ status at the CEPI sampling locations during February 2018

Sl. No	Parameters	Mean mg/l	Standards
1.	NO_2	29.80	80
2.	PM_{10}	100.32	100
3.	$PM_{2.5}$	46.59	60

2.4 Industries Stack Emission Details

2.4.1 Industries Stack Emission Sources

All the industries functioning within Erode CEPI area has provided necessary air pollution control measures for the emission sources. The details of the stack in large scale industries functioning within CEPI area is given below.

Table 2.3 Details of Stack Emission Load

S.No	Company Name	Emission Sources	APC Measures Provided	Stack Height Mtr	PM (kg/d)	SO_2 (kg/d)	NO_2 (kg/d)
1.	M/s. S P Textile Processors Pvt Ltd.,	1. Boiler 4 T/hr & 3 T/hr	Common Stack	30	24.41	2.8	2.24
2.	M/s.SCM Textile Processing Mills,	1. Thermopac 2500 U (standby for Thermopac 4000 U)	Common stack with individual cyclomax dust collector	20	125.13	113.98	17.3
3.	M/s The Erode District Co-op Milk Producers Union Ltd., AAVIN	Boiler 5 T/hr	Dust collector with stack	14.8	157.7	872.18	346.3
4.	M/s. INDIA DYEING MILLS(P) LTD.,	1. Common RCC Chimney for Thermopac Units (3 Nos) (5000U, 3000 U & 1500U)	Dust Collector	40	38.77	43.22	16.52
		2. Common RCC Chimney for Boiler (3 Nos) (12 T, 6 T & 6T)	Cyclomax Parallel with Bag filter	40	100.7	68.1	25.35
		3. Common RCC Chimney for Boiler 1 Nos & Thermopac 2 Nos. (3000U & 8T-2 Nos)	Cyclomax Parallel with Bag filter	40	86.66	41.54	15.72
		2.Thermopac 20 Lakh Kcal /hr	Dust collector with stack	14			
5.	M/s. PIONEER PROCESSING INDIA, (A DIVISION OF JANSONS INDUSTRIES LTD.,)	1.Boiler – 6(T/Hr.) & Thermopac 4000 U	Common stack	30.5	24.39	4.13	1.08
		2. Boiler 6 T/hr					
		3. Thermopac 2500 U	Stack	30.5	34.87	10.28	1.46
	Total			259.8	592.63	1156.23	425.97

2.4.2 Stack Survey Results:

For 2018-19

Sl. No	Name of the Industry	STACK mg/m3				
		PM	SO_2	NO_2	CO	NH_3
1.	M/s. S P Textile Processors Pvt Ltd,	68	17	11	-	-
2.	M/s.SCM Textile Processing Mills Ltd., (Dyeing Division)	101	92	14	-	-
3.	M/s. India Dyeing Mills(P) LTD.,	139	94	35	-	-
4.	M/s The Erode District Co-op Milk Producer Union Ltd., (Aavin)	132	49	21	-	-
5.	M/s. Pioneer Processing India, (A Division of Jansons Industries Ltd)	112	19	5	-	-

2.5 Quantification of Stack Emission Load

2.5.1 For 2018-2019

1. M/s. S P Textile Processors Pvt Ltd.,

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_2 mg/Nm^3	Pollution load Kg/day	CO mg/Nm^3	Pollution load Kg/day
Boiler 4 T/hr & 3 T/hr (Common stack)	11694	87	24.41	10	2.80	8	2.24	-	-

2. M/s.SCM Textile Processing Mills.,

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_2 mg/Nm^3	Pollution load Kg/day	CO mg/Nm^3	Pollution load Kg/day
1. Thermopac 2500 U (standby for Thermopac 4000 U)	51623	101	125.13	92	113.98	14	17.3	-	-
2. DG Set 500 KVA	883	47	0.99	53	1.12	8	0.16	-	-

3. M/s The Erode District Co-op Milk Producer Union Ltd., (Aavin)

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_2 mg/Nm^3	Pollution load Kg/day	CO mg/Nm^3	Pollution load Kg/day
1. Boiler 5 T/hr	534430	123	157.7	68	872.18	27	346.3	-	-

4. M/s. INDIA DYEING MILLS (P) LTD.,

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_2 mg/Nm^3	Pollution load Kg/day	CO mg/Nm^3	Pollution load Kg/day
1. Common RCC Chimney for Thermopac Units (3 Nos) (5000U, 3000 U & 1500U)	26484	61	38.77	68	43.22	26	16.52	-	-

2. Common RCC Chimney for Boiler (3 Nos) (12 T, 6 T & 6T)	30188	139	100.70	94	68.10	35	25.35	-	-
3. Common RCC Chimney for Boiler 1 Nos & Thermopac 2 Nos. (3000U & 8T-2 Nos)	29845	121	86.66	58	41.54	22	15.75	-	-

5. M/s. PIONEER PROCESSING INDIA (A DIVISION OF JANSONS INDUSTRIES LTD.,)

Stack details	Flow Rate (m^3/hr)	PM mg/Nm^3	Pollution load Kg/day	SO_2 mg/Nm^3	Pollution load Kg/day	NO_2 mg/Nm^3	Pollution load Kg/day	CO mg/Nm^3	Pollution load Kg/day
1. Boiler 6 T/hr	9075	112	24.39	19	4.13	5	1.08	-	-
2. Thermopac 2500 U	15298	95	34.87	28	10.28	4	1.46	-	-

2.6 Consolidated Stack Emission Load

The total quantity of the stack emission load within the CEPI core area is found to be as below.

(i) Particulate Matter – 593.62 kg/day

(ii) SO_2 – 1157.35 kg/day

(iii) NO_2 – 426.16 kg/day

The boiler operation in all the small scale industries are found only intermittent and not continuous. Hence the air pollution load due to emission from the boiler of small scale industries has not been considered. In addition those small scale industries have also provided adequate Air Pollution control measures to reduce the emission from its stack.

2.7 Status of Ambient Air Quality in 2019 in CEPI Area

The status of the Ambient Air Quality in Erode CEPI area during the survey conducted in December 2019 is as below.

Table 2.4 AAQ status at the CEPI sampling locations during December 2019

SL. No	Dateof Survey	Location	Parameters			
			Pollutant (in µg/cubic metre)			
			$PM_{2.5}$	PM_{10}	SO_2	NO_2
1.	04.12.2019 to 05.12.2019	Vendipalayam (Sri Vignesh Building)	18	50	11	21
2.	04.12.2019 to 05.12.2019	Vairapalayam (Manjula Bleaching Factory-On Top of Admin Office)	23	59	9	23
3.	04.12.2019 to 05.12.2019	Karuvilparaivalasu (H.No.35/A-Villarasan Post)	16	48	9	22
4.	04.12.2019 to 05.12.2019	Chitthode (H.No.6,Thirupathi Thottam,Thattan Kuttai Medu)	20	49	8	20

Note: During 2018, the CPCB has chosen 8 AAQ stations. However, AAQ station Nos.5,6,7 & 8 are located beyond 5 to 10 km from the CEPI core area. Hence the far away locations are not considered. Hence additional four locations are chosen in CEPI core/impact area in addition to the existing four stations within the core area.

From the AAQ survey conducted in the CEPI area the following are the pollutant loads within CEPI area.

Table – 2.5 Details of Pollutant loads in CEPI Area

Sl.No.	AAQ Locations	PM 2.5 mg/d	PM10 mg/d	PM mg/d	SO_2 mg/d	NO_2 mg/d
1.	Vendipalayam (Sri Vignesh Building)	0.432	86.4	86.832	7.92	15.12
2.	Vairapalayam (Manjula Bleaching Factory-On Top of Admin Office)	0.552	101.952	102.504	6.48	16.56
3.	Karuvilparaivalasu (H.No.35/A-Villarasan Post)	0.384	82.944	83.328	6.48	15.84
4.	Chitthode (H.No.6,Thirupathi Thottam,Thattan Kuttai Medu)	0.48	84.672	85.152	5.76	14.4
Mean		0.462	88.992	89.454	6.66	15.48

2.8 Conclusion

The values of the air pollution load in the CPCB identified locations within Erode CEPI area is within the desirable limit which indicates that the quantum of the air pollution has been reduced in the CEPI core area. Necessary APC measures such as dust collectors, wet scrubber etc., are provided to the emission sources during 2018-19 & 2019-20 in most of the industries within CEPI area. Additional Air Pollution Control measures required in the industries located in CEPI area will be provided to further improve Air Quality in CEPI area.

Ambient air monitoring conducted during 2018 by CPCB in which four of the locations out of eight have exceeded PM10. This may be due to localised sources like construction activities, UGDSS works as well as vehicular emission. The industries sources emission load is 592 kg/day and average stack height 30m which clearly indicates the PM contribution from industrial emission sources are minimum.

CHAPTER - 3

WATER ENVIRONMENT

CHAPTER - 3

3. WATER ENVIRONMENT

3.1 Primary and Secondary Pollutants Considered for SWEPI

The primary pollutant considered for calculating the Water EPI in Erode industrial cluster is Total Phosphorous. The secondary pollutants considered for calculating the Water EPI is Total hardness and Total Kjeldhal Nitrogen (TKN). The CEPI score for the Water Environment during 2018 is 47 which indicates that the Surface Water Quality Index is normal.

3.2 Surface Water Sampling Locations

The sampling points identified for analyzing quality of surface water with respect to CEPI pertaining to Erode industrial cluster are summarized as below (Map Enclosed).

Table – 3.1 Details of sampling points

Sl. No.	Location	Latitude	Longitude
SW-1	Cauvery River Upstream Near New Tirupur Area Development Corporation Limited (NTADCL)- R.N Pudhur.	N 11°25’7.31’’	E077°40’50.37”
SW-2	Cauvery River Downstream Near Vendipalayam Barrage	N 11°19’53’’	E077°45’28’’
SW-3	Kalingarayan Canal Upstream Near New Tiruppur Area Development Corporation Limited- R.N Pudhur	N 11°25’06’’	E077°40’47’’
SW-4	Kalingarayan Canal Downstream Near Vendipalayam Barrage	N 11°19’38’’	E077°45’10’’
SW-5	Cauvery River at Agraharam Barrage	N 11°22’55.72’’	E077°42’39.90’’
SW-6	Kalingarayan Canal at B.P Agraharam Barrage Road	N 11°22’48.39’’	E077°42’15.02’’
SW-7	Karuvilparaivalasu Tank	N 11°21’9.83’’	E077°40’32.74’’

Note: In Erode industrial area seven surface water sampling locations were identified and samples were collected during February 2018 as a part of "CPCB Project on Monitoring of Ambient Air and Water Quality under CEPI program in selected industrial/ cluster areas, South Zone: 2017-18". The sample numbers SWQ-5, SWQ-6, SWQ-7 were collected from the surface waters outside the CEPI core area and located beyond 11 km distance. Hence new locations are added within the CEPI core area by replacing the previous surface water locations SWQ-5, SWQ-6, SWQ-7.

Legend

CEPI Surface Water Sampling Locations

Railway Station

Surface water samples:

CEPI SW-1-Cauvery River at U/S

CEPI SW-2-Cauvery River at D/S

CEPI SW-3-Kalingarayan at U/S

CEPI SW-4-Kalingarayan at D/S

CEPI SW-5-Cauvery River at Agraharam Barrage

CEPI SW-6-Kalingarayan at B.P Agraharam

CEPI SW-7-Karuvilparai valasu Tank

Fig- 3.1 Map showing the surface water sampling locations in Erode CEPI area

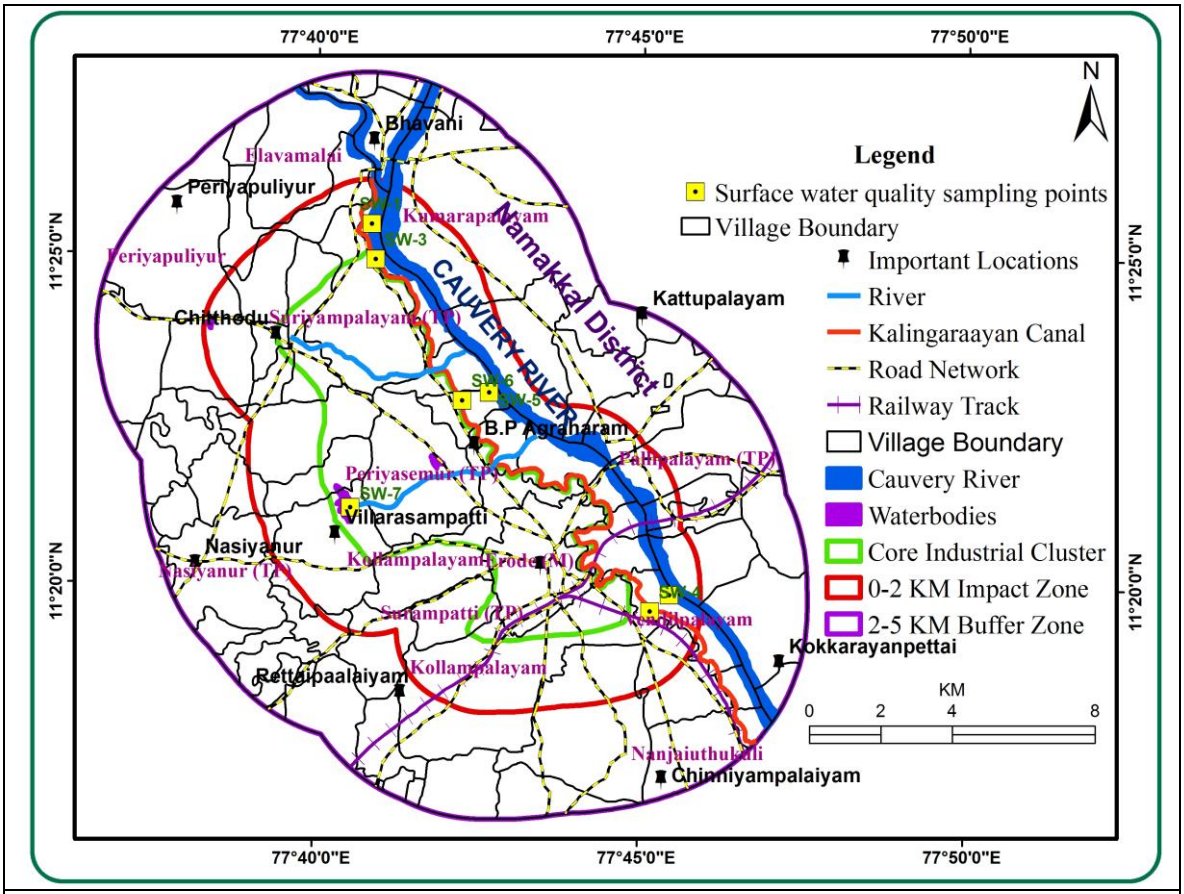


Fig-3.2 Digital map showing the location of surface water sampling location in Erode CEPI area

3.3 Details of Effluent Generation from the Major Industries located in CEPI Core Area

The details of major industries located in CEPI core area are detailed as below,

Table – 3.2 Details of major industries within CEPI area

Sl. No.	Name & address of the industries	Category	Type of the industry	Quantity of effluent in KLD
1.	M/s. India Dyeing Mills P Ltd, S.P Agraharam, Bhavani Main Road, Erode 5	Red Large	Bleaching, Dyeing & Printing	4000
2.	M/s. Pioneer Processing India – A Division of Jansons Industries Ltd, Bhavani Main Road, Ramanathapuram pudur Post, Erode 638005	Red Large	Bleaching, Dyeing & Printing	1400
3.	M/s. S.P.Textile Processors Pvt Ltd, Suriyampalayam Village and Kumilamparappu Village, Perumalmalai Road, NearAavinMilkDairy, Chithode, Erode 638102	Red Large	Bleaching & Dyeing	605
4.	M/s. Shiny Processing Mills Private Limited, Vettukkattuvalasu, Erode 638 011	Red Large	Bleaching, Dyeing & Printing	500
5.	M/s. SCM Textile Processing Mills, 29 –C, Marapalam Road, K A S Nagar, Karungalpalayam, Erode 03	Red Large	Bleaching & Dyeing	1730.96
6.	M/s Rajalakshmi Textile Processors, Suriyampalayam, Erode.	Red Large	Bleaching & Dyeing	500
7.	M/s. Tamil Nadu Co-operative Textile Processing Mills, Ashokapuram, Bhavani Main Road, Erode	Red Medium	Bleaching, Dyeing & Printing	500
8.	M/s. Ero Dyeing, Suriyampalayam Village, Javuli Nagar, Bhavani Main Road, Erode	Red Medium	Bleaching, Dyeing & Printing	1100
		Total		10935.96

The entire quantity of above said major industries is treated and reused in the process. During 2018-19, these industries have provided ATFD/ pusher centrifuge for the treatment and disposal of final reject generated. Hence the disposal of final reject into solar evaporation pan has been reduced.

The details of the industries located (Red and Orange Category) located within the CEPI core area are as below.

Table – 3.3 Details of industries located in Severely Polluted area

Category	No. of industries
Red Large	7
Red Medium	2
Red Small (Dyeing, Bleaching & Printing, Tanneries)	589
Orange Large	6
Orange medium	2
Orange Small	243
Total	849

3.3.1 Trade effluent generated by the textile processing units and its disposal methods.

Table – 3.4 Details of textile processing & Tannery units

Type	Total No. of Units applied for consent	ZLDs provided in Nos.	Total trade effluent generation (MLD)
Bleaching Units	281	240	22.27
Printing Units	146	25	1.68
Dyeing Units	163	163	22.61
Tanneries	37	37	2.02
Total	590	428	48.58

Out of the total quantity of effluent generated, 46.90 MLD is treated and recycled through ZLD system. The R.O permeate and Mechanical Evaporator (MEE)

condensate are reused by these industries. R.O reject /MEE concentrate are disposed through Solar evaporation Pan (SEP)/ Agitated Thin Film dryer (ATFD). Mixed salt is recovered from the Reject Management System (RMS).

Rest of the effluent i.e., 1.69 MLD effluent is treated through ETP and the treated trade effluent is partly reused and partly disposed on land for irrigation. All the industries functioning in the CEPI core area has adequate capacity individual treatment plants/ zero liquid discharge system.

3.4 Domestic Waste Water Generation and Disposal in CEPI Area

3.4.1 Surface Water Environment

River Cauvery flows on the North Eastern side of the CEPI core and buffer area and traverses to a distance of about 12 km on the Northern side of the CEPI core area. The river flows at a distance of 50m to 500m from the CEPI core area.

The Kalingarayan canal forms the North Eastern boundary of core CEPI area in Erode and flows to a distance of 15.5 km forming the North Eastern boundary of the identified CEPI core area.

3.4.2 Surface Water Pollution

The discharge of untreated domestic sewage from the Erode City Municipal Corporation in CEPI core area are the predominant sources of water pollution.

3.4.3 Domestic Sewage Pollution Contribution

Erode City Municipal Corporation consists of 60 wards. At present, the Under Ground Drainage Sewerage System (UGDSS) works are completed in 27 wards and the sewage generated from these wards are collected and treated through the Erode City Municipal Corporation Sewage Treatment Plant (STP)of capacity – 50.55 MLD functioning at Peelamedu Village, Vendipalayam. The Erode City Municipal Corporation has obtained CTO from the TNPC Board for the STP with validity up to 31.03.2020.

The treated sewage after meeting the discharge standards is discharged into Perumpallam Odai which finally reaches River Cauvery at the upstream of Vendipalayam barrage. The sludge generated from the STP is composted through micro composting centre and disposed as manure. The Corporation is in the process of providing UGDSS covering the remaining 33 wards.

TNPCB has issued Directions under Section 5 of the Environment (Protection) Act, 1986 as amended to the Commissioner, Erode City Municipal Corporation to expedite the UGDSS works in 33 wards of Erode Corporation in a time bound manner so as to prevent the disposal of untreated sewage (about 22 MLD) into River Cauvery and Kalingarayan canal.

3.4.4 Others: (agricultural runoff, leachate from MSW dumpsites and illegal dump site)

The agricultural runoff from the Kalingarayan Ayacut and LPB Ayacut contributes surface and groundwater pollution. The leachate generated from the MSW dump sites at Vairapalayam (illegal dumpsite) and Vendipalayam reaches River Cauvery and Kalingarayan canal respectively.

3.4.5 Surface Water Monitoring

Tamilnadu Pollution Control Board is monitoring the River Cauvery and Kalingarayan canal under the Monitoring of Indian National Aquatic Resources (MINARS) programme, and water samples are being collected and analyzed periodically. The power supplies of the violating industries are disconnected through the District Co-ordination Committee headed by the District Collector, Erode.

3.4.6 Sewage Generation & Disposal

The maximum quantity of total swage generation from the Erode City Municipal Corporation area is 30 MLD. The Corporation has provided sewage treatment plant of capacity 50.55 MLD. The sewage generated from 27 wards (approximately 8 MLD) of the corporation is collected and treated in the STP. The treated sewage after meeting the standards is disposed into Perumpallam Odai which ultimately joins with River Cauvery. The remaining 22 MLD of untreated sewage is directly disposed into various water streams and finally reaches River Cauvery. The Directions under Section 5 of the Environment (Protection) Act, 1986 as amended was issued to the Commissioner, Erode City Municipal Corporation to expedite the UGDSS works in 33 wards of Erode Corporation in a time bound manner so as to prevent the disposal of untreated sewage (about 22 MLD) into River Cauvery and Kalingarayan canal.

3.5 Industrial and Domestic Waste Water Impact on Surface Water Bodies

The untreated sewage discharged into the existing Odais finally confluences with River Cauvery which results in surface water pollution. The industries have provided ZLDs hence there is no discharge of effluent from the industries.

3.6 Common Effluent Treatment Plant Facilities in Erode Industrial Cluster

The existing textile dyeing & bleaching industries are having individual effluent treatment plants for the treatment and disposal of trade effluent generated. The effluent treated in the individual effluent treatment plants are recovered and reused by the industries. Based on the guidance of Tamilnadu Pollution Control Board, these industries have proposed to form common effluent treatment plants by availing 50% central subsidy, 25% state subsidy and remaining 25% through bank loan and contribution from the industries. Four common effluent treatment plants and one Common Reject Management Systems (CRMS) are proposed for the textile dyeing & bleaching industries. The proposed four CETPs managements have purchased 22 acres of land for the establishment of CETPs at SP. Agraharam Village, Erode Taluk, Erode District. The detailed project report is prepared by M/s. Enkem Engineers Pvt Ltd., Chennai and the same is approved by Indian Institute of Technology Madras (IIT), Chennai. The proposed four CETPs are in the process of submitting application to TNPCB for obtaining CTE. The CETPs are expected to complete the construction, erection and commissioning of the ZLDs during 2021.

Table – 3.5 Details of proposed CETPs

Sl. No	Name of the proposed CETPs	Capacity in MLD	No. of member bleaching / dyeing units
1.	M/s Green Kalingarayan CETP Pvt Ltd.,	5.80	82
2.	M/s Villarasampatti CETP Pvt Ltd.,	4.50	85
3.	M/s Suriyampalayam CETP Pvt Ltd.,	4.20	36
4.	M/s Gangapuram CETP Pvt Ltd.,	6.20	38
5.	Erode Common RMS Plant for large scale units	1.50	18

3.7 Status of Surface Water Quality in 2018 in Erode Industrial Cluster

Table 3.6 Status of the surface water in CEPI area during February 2018

Sl. No	Parameters	Mean mg/l	Standards
1.	Total Hardness	494.38	600
2.	Total Phosphorous	0.25	0.3
3.	TKN	2.09	3

3.8 Status of Surface Water Quality in November/ December 2019 in Erode Industrial Cluster

Table 3.7 Status of the surface water in CEPI area during December 2019

Parameters	Cauvery River at NTADCL (U/s)	Cauvery River at Vendipalayam (D/s)	Kalingarayan canal at NTADCL (U/s)	Kalingarayan canal at Vendipalayam (D/s)	Kalingarayan canal at B.P Agraharam	Cauvery River at Agraharam Barrage	Karuvilparaivalasu Tank	Mean
Total hardness (mg/l)	4190	1328	947	210	852	1183	173	1253
TDS (mg/l)	1520	760	720	160	740	460	480	620
TKN (mg/l)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	0.5

The surface water quality in the CEPI core area and impact area is within the desirable levels. The existing wastewater treatment plants provided by the industries will be monitored periodically to maintain the surface water quality within the desirable levels.

3.9 Conclusion

During CPCB's CEPI sampling, all the surface water bodies within Erode were having lean flow and that may be due to domestic waste water. The total sewage discharged into surface water body is around 22 MLD which clearly indicates the high concentration of total phosphorous and TKN only because of sewage and not because of effluent discharge from the industries.

During 2018 sampling by the CPCB, four samples were collected from the points located far away from Erode CEPI core area i.e., more than 7 km. Hence additionally three surface water sampling points were identified within the core area and included the same in evaluation of CEPI score for 2019.

CHAPTER - 4

LAND ENVIRONMENT
(Soil and Ground Water)

CHAPTER - 4
LAND ENVIRONMENT
(Soil and Ground Water)

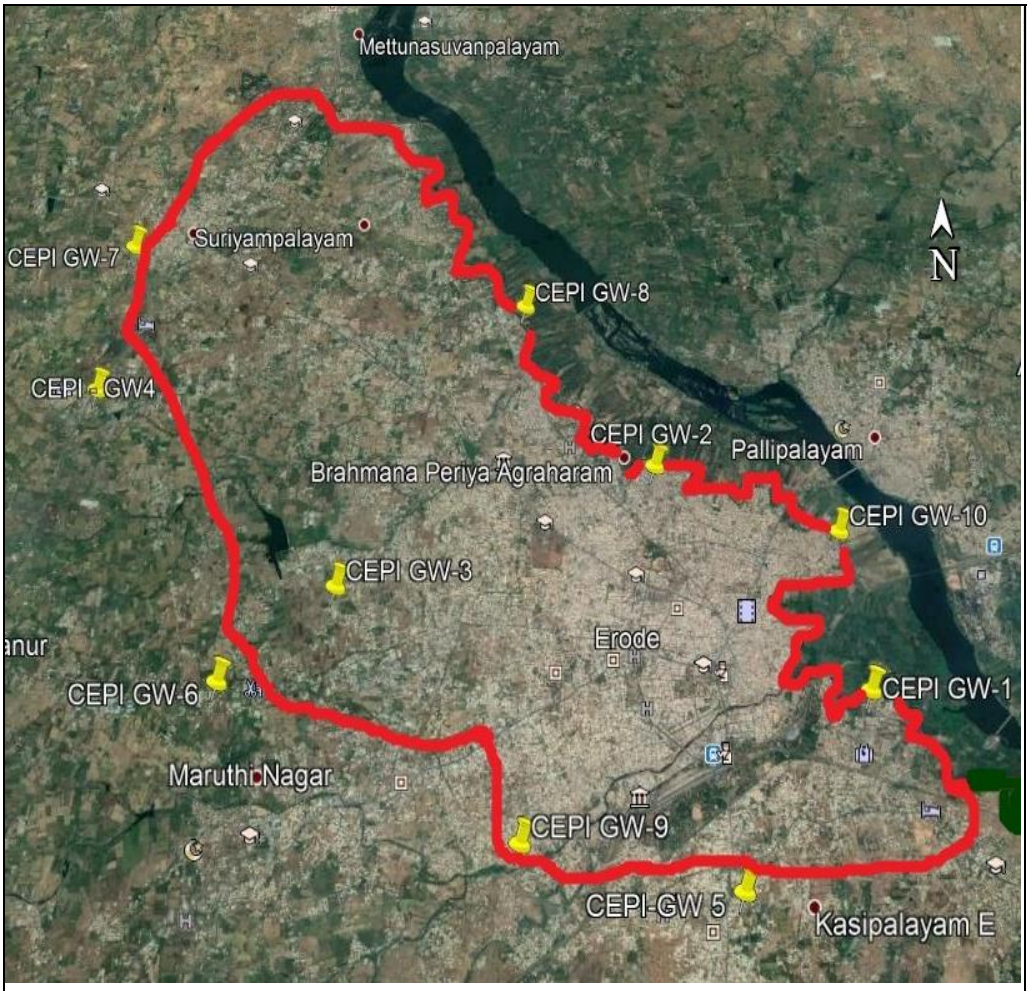
4.1 Primary and Secondary Pollutants Considered for GWEPI

The primary pollutant considered for calculating the Ground Water EPI in Erode industrial cluster is Total Dissolved Solids. The secondary pollutants considered for calculating the Ground Water EPI is Total hardness and Total Kjeldal Nitrogen (TKN). The CEPI score for the Ground Water (Land) Environment during 2018 is 52.75.

4.2 Ground Water Quality Sampling Locations

Table 4.1 Sampling points identified for analyzing quality of land

Nos.	Location	Latitude	Longitude
GW-1	Vendipalayam Open Well Water –Backside of M.S.W Dump Site (Kalyana Sundaram Street)	N 11°20’2.23’’	E077°44’36.64”’
GW-2	Vairapalayam Mariamman Kovil street,Ward No.11- Bore Well Water	N 11°21’36’’	E077°43’11’’
GW-3	Kaikatti Valasu Hand Bore Well Water Near Sakthi Mariamman Annadanam Mandabam	N 11°20’45’’	E077°40’54’’
GW-4	Hand Bore Well Water Gangapuram Main Road (Opposite to Tex Valley)	N 11°22’13’’	E077°38’58’’
GW-5	Bore Well in Thiru.Murugesan residence, No.12, Nehruji Street, Moolapalayam, Erode.	N 11°18’55.30’’	E077°43’42.00”
GW-6	Bore well in Thiru.Moorthy’s Residence, Blue Diamond Nagar, Villarasampatti, Erode.	N 11°20’8.47’’	E077°40’7.53”
GW-7	Bore Well at Thiru.Eswara Moorthy’s residence, 85B, Sellappampalayam, Chitthode.	N 11°23’23.66’’	E077°39’5.13”
GW-8	Borewell at B.P Agraharam	N 11°22’51.02’’	E077°42’12.81”
GW-9	Public Borewell at Kasipalayam	N 11°19’8.03’’	E077°42’13.02”
GW-10	Borewell at Karungalpalayam	N 11°21’9.03’’	E077°44’29.47”



Ground water samples:

CEPI GW-1- Vendipalayam
CEPI GW-2- Vairapalayam
CEPI GW-3- Kaikattivalasu
CEPI GW-4- Gangapuram
CEPI GW-5- Moolapalayam
CEPI GW-6 Villarasampatti
CEPI GW-7 Sellappampalayam
CEPI GW-8- B.P. Agraharam
CEPI GW-9- Kasipalayam
CEPI GW-10 Karungalpalayam

Fig. 4.1 Map showing the Ground water sampling locations in Erode CEPI area

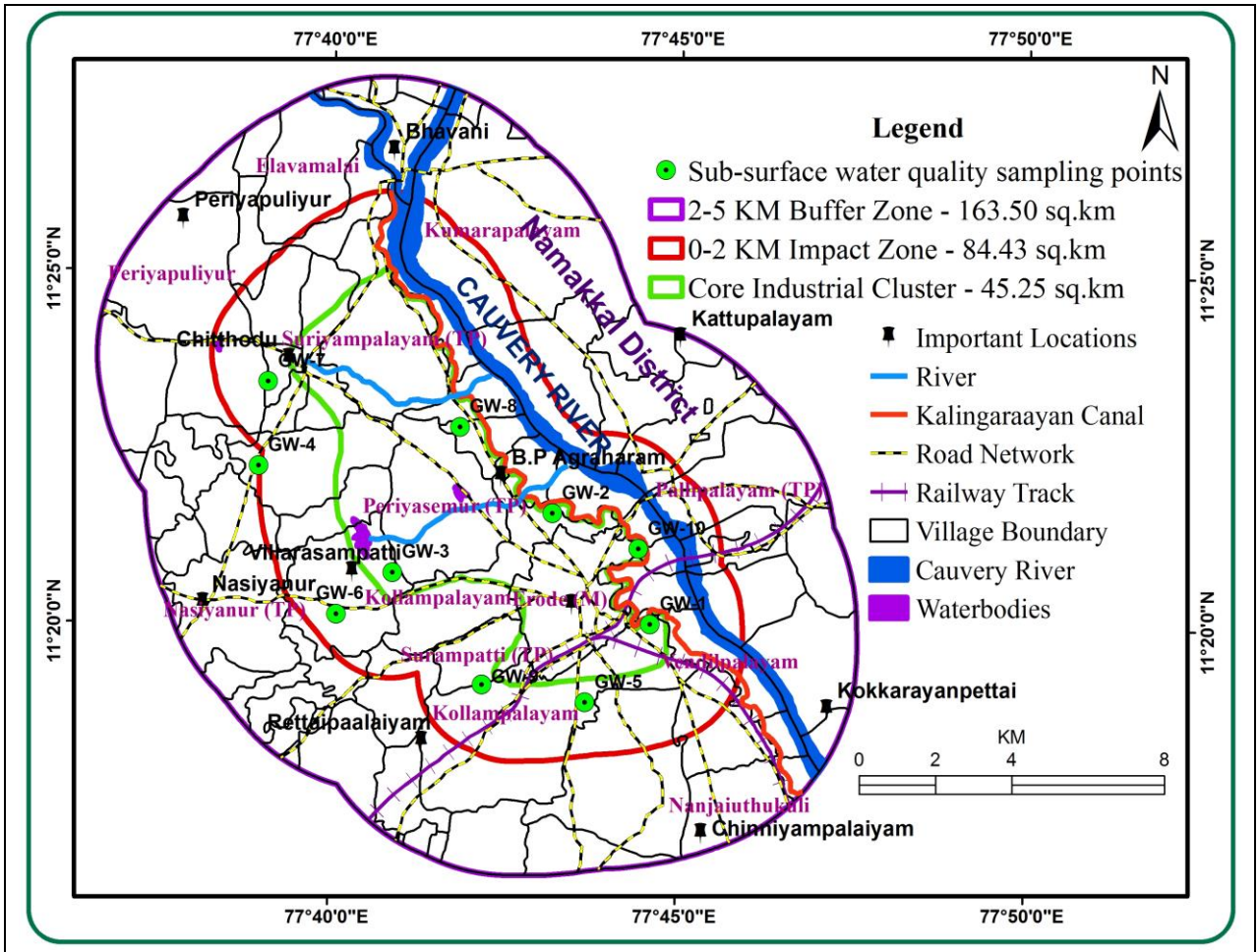


Fig. 4.2 Digital map showing Groundwater sampling locations

4.3 Status of Ground Water Quality in 2018 in CEPI Area

The status of the groundwater quality during 2018 is as below.

Table 4.2 Quality (Mean) of Groundwater in CEPI Area during 2018

Sl. No	Parameters	Mean mg/l	Standards
1.	TDS	2278.81	200
2.	Total Hardness	813	600
3.	TKN	0.98	1

4.4 Status of Ground Water Quality during November/ December 2019 in CEPI Area

The status of the groundwater during December 2019 has been analysed and the characteristics are as below.

Table 4.3 Groundwater parameters within CEPI area during November & December 2019

Parameters	Open well at Vendipalayam	Bore well at Vairapalayam	Public bore well at Kaikativalasu	Borewell at Moolapalayam	Borewell at Villarasampatti	Public bore well at Gangapuram	Bore well at Sellappampalayam	Bore well at B.P Agraharam	Public Bore well at Kasipalayam	Bore well at Karungalpalayam
Total Hardness (mg/L)	1520	760	790	720	160	490	740	460	480	620
TDS (mg/L)	4190	1328	1024	947	210	852	852	1183	173	1253
Total Phosphorous as P (mg/L)	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL	0.39	BDL (DL: 0.05)	BDL	0.49	0.16	0.3	0.12
TKN (mg/L)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)

The open well at Vendipalayam is located at distance of 50 m from the MSW dump site. This well water contains mostly the leachateseeping from the MSW dump site so that the TDS and Total Harness are very high and could not able to compare with drinking water standards. At present the legacy wastes at the Vairapalayam dump site (on Cauvery River bank) is being biomined. The Erode City Municipal Corporation has also proposed to vacate the MSW dumped in Vendipalayam through biomining. Once, the MSW biomining activities are completed in these dump sites , the lechate impact to the ground water will be prevented and the water quality will be improved.

Note: In Erode industrial area nine groundwater sampling locations were identified and samples were collected during February 2018 as a part of "CPCB Project on Monitoring of Ambient Air and Water Quality under CEPI program in selected industrial/ cluster areas, South Zone: 2017-18". The sample nos. GWQ-5, GWQ-6, GWQ-7, GWQ-8, GWQ-9 were collected from the wells located far away i.e., around 12 km from the CEPI core area. Hence new locations are added within the CEPI core area/ impact area by replacing the previous groundwater locations GWQ-5, GWQ-6, GWQ-7, GWQ-8, GWQ-9.

4.4.1 Improvement measures carried out in the CEPI core area for the reversal of land pollution

The total quantity of MSW generated within Erode Corporation is around 250 T/day. The Corporation has provided 19 micro composting centers at various locations for composting the organic MSW. A MSW composting centre operated by M/s. IL & FS with capacity of 100 T/day and is located within the Vendipalayam MSW dump site. Besides, the MSW generated from Erode Corporation are dumped at Vendipalayam dump site and at the right bank of River Cauvery at Vairapalayam.

The Corporation is also operating a biomethanation plant at Vendipalayam to handle and dispose the vegetable and other organic wastes. M/s MAK India Ltd., Coimbatore has installed an incinerator to dispose a part of the non-biodegradable municipal solid waste generated within Erode City Municipal Corporation in association with M/s Olirum Erode Foundation, a NGO. The incinerator is provided to dispose 55 T of MSW (Dry waste) per day. As per the directions of the Board, the Corporation has started biomining the MSW dumped at Cauvery River bank so as to remove the accumulated MSW dumped on the river bank. The organic compost produced is given to farmers at free of cost.

4.4.2 Improvement activities carried out by the industries in the CEPI area

The following industries have provided adequate capacity of Multiple Effect Evaporator followed by Agitated Thin Film Dryer so as to handle and dispose the final reject generated from the Zero Liquid Discharge system.

Table - 4.4 List of Industries Provided MEE & ATFD during 2017 - 2019

S.No	Name of the industries
1.	M/s India Dyeing Mills P Ltd
2.	M/s Pioneer Processing India
3.	M/s SCM Textile Processing Mills (Dyeing, Bleaching and M/s Printing Division)
4.	M/s Shiny Processing Mills Private Limited
5.	M/s Santhi Processing Unit Pvt Ltd
6.	M/s Aruna Textile Processing Mills
7.	M/s Jayabalaji Dyeing
8.	M/s Naveena Printing Mill
9	M/s SCM Textile Processing-Bleaching division

10.	M/s Sri Lakshmi Bleaching Dyeing And Printing
11.	M/s Samurai Textile Process
12.	M/s Murthi Dyeing
13.	M/s Srri Jeyashakkthy Textiles-SreeSakthiTex
14.	M/s Srri Sakthy Textiles Mills
15.	M/s Velmurugan Process
16.	M/s Imperrial Textile Dyers
17.	M/s Premier Textile Dyers
18.	M/s The TN Co-Op Textile Processing Mill Ltd
19.	M/s Siva Mohan Dye House
20.	M/s Southern Sarees
21.	M/s KKSK Tanning Company
22.	M/s Armstrong Process
23.	M/s Ero Dyeing
24.	M/s Thiruvalluvar Textiles
25.	M/s Phoenix Textile Processors
26.	M/s Muthu Knit Process
27.	M/s Sri Sakthi Murugan Processing Mill

Table 4.5 List of industries in which MEE & ATFD is under installation

S.No	Name of the industries
1.	M/s Meridean Textile Dyers
2.	M/s Golden Textile Dyers
3.	M/s Jai Textile Unit Private Limited
4.	M/s Sri Anandhalakshmi Bleaching Company
5.	M/s NKG Leathers
6.	M/s KKSK Leather Processing Company

As the above mentioned industries have provided/ providing the adequate capacity of Multiple Effect Evaporator followed by Agitated Thin Film Dryer, the disposal of the final reject into ground level solar evaporation pans will be stopped preventing unnoticeable seepage of high TDS effluent in to substrata. Hence the groundwater quality within the CEPI area will be considerably improved.

4.5 Management of hazardous Waste in Erode CEPI Area

The total number of the hazardous waste generating units located within Erode CEPI area is 256 which includes textile processing and tannery sectors.

Table - 4.6 Details of Hazardous Wastes in Erode CEPI Area

Total No. of industries	Status as on	Total Quantity Generated	Total Quantity Disposed	Type of Disposal
256	31.03.2019	7240.377	5702.376	TSDF/Co-Processing

All the ETP sludge generated from the units located within CEPI area are collected and disposed through co-processing in authorised cement kilns and through TSDF, Gummudipoondi/ Viruthunagar. All the units have provided sludge storage arrangements/ shed within the premises.

4.6 Management of Biomedical Wastes in Erode CEPI Area

The details of the health care facilities & biomedical wastes generated within Erode CEPI core area are as below.

(a) Total No. of Health Care Facilities - 136 Nos.
(b) Applied for consent - 136 Nos.
(c) No. of clinics/labs obtained one time authorization - 192 Nos.
(d) Biomedical Waste Authorisation issued - 328 Nos.
(e) Total Quantity of BMW generated - 215 kg/day
(f) Common biomedical waste facility - Nil

The biomedical wastes generated in the Erode area is collected and disposed through a common biomedical waste management facility located at Edapadi, Salem District. No common biomedical waste disposal facility is located with Erode District.

4.7 Management of Municipal Solid Waste in CEPI Area

Earlier, the municipal solid wastes generated within the Erode City Municipal Corporation is dumped at MSW dump site located at Vendipalayam. Due to lack of land area and facilities, the MSW generated in the Corporation area was dumped on the right bank of River Cauvery at Vairapalayam up to 2018 which resulted in seepage of leachate into the ground and also discharge of leachate into River Cauvery.

4.7.1 Action taken during 2018 against the dumping of MSW at Vendipalayam & Vairapalayam (At the Right bank of River Cauvery) for the improvement of surface and groundwater quality

TNPCB has issued Directions under Section 5 of Environment (Protection) Act, 1986 as amended was issued by the Board vide Proc. No. T1/TNPCB/F.28787/Compl/ERD/2017 dated: 03.01.2018 to the Commissioner, Erode Corporation to stop dumping of MSW on the bank of River Cauvery at Vairapalayam and to comply with the Solid Waste Management Rules, 2016.

Subsequently, the Erode Corporation has established the following MSW processing facilities to handle and manage the MSW generated within the Corporation area.

Table 4.7 Current status of solid waste management in Erode CEPI area

S. No.	Name of the urban local body	Qty of waste processed	Quantity for which Authorisation issued	Details of each waste processing facilities (MCC/OCC/Biomethanation) its capacity and operational status	
				Name of the facility and location	Capacity
1.	Erode City Municipal Corporation	100 T/day	100 T/day	M/s. IL & FS Environmental Infrastructure and Services Limited, S.F.No.1304, Erode Village, Erode Taluk and District.	100 T/day
2.		49 T/day	49 T/day	19 Nos. of micro composting centers are functioning at various locations of Corporation area	
3.		10 T/d	Generation of Bio gas of 500 cu.m/d from 10 T/day of waste generated	M/s. Erode Municipal Corporation-Biomethanisation Plant,S.F.No.1304, Erode M Bit 1 Village, Erode Taluk and District.	10 T/d
4.		50 T/day	Incineration of Non bio degradable MSW 50 T/day	M/s. Mak Green Incinerator, S.F.No.63/3B, Nanjaithalavaipalayam Village, Erode Taluk, Erode District.	50 T/day

Due to provisions of the above mentioned facilties, the MSW generated within the Erode Corporation is handled in the decentralised facilities instead of dumping in the above said areas. This resulted in reduction of ground water contamination near the dump site areas.

4.7.2 Bio-mining of MSW dumped at Vairapalayam (Right bank of River Cauvery)

The functioning of decentralised micro composting centres (19 Nos) at various locations in Erode Corporation area, the quantity of the MSW received at the existing dump sites are completely stopped. In addition, the Corporation has given contract to M/s Zigma Global Environ Solutions Pvt Ltd., Erode, to biomine the MSW dumped on the Cauvery River bank at Vairapalayam. The unit has carried out contour survey and assessed the quantity of accumulated MSW as 65,507 cu.m. The bio-mining site is located at a distance of 100m from the accumulated MSW site/ legacy waste site. The unit has processed 14000 tonnes of legacy waste as on 30.10.2019.

4.8 Details of STPs/ ETPs

The Erode city municipal Corporation has provided Sewage Treatment Plant at Peelamedu Village near Vendiapalaym and obtained CTO from the Board for a capacity of 50.55 MLD. At present only 8 MLD of sewage collected from the 27 wards is treated through the STP. The rest of the sewage generated from the Corporation is not collected due to incompletion of the UGDSS.

All the textile processing and tannery industries located within the CEPI area has provided individual effluent treatment plant with RO system and RMS (ZLD system). The other industries have also provided effluent treatment plant to treat the trade effluent generated.

4.9 Conclusion

The Ground Water EPI for the samples collected by the CPCB during 2018 is found high due to the sample collected from the well located very nearer to the MSW dumpsite. Five ground water sampling locations of the bore wells located far away (6-10km) from the core area has been replaced with alternate six sampling locations in the core and impact zone. The hazardous waste generated by the textile dyeing and tanneries have been transported to cement industries for co-processing. Temporary storage of the sludge within the premises of the industry is stored in closed shed on paved platform. Hence there is no impact of leachate on ground water. Further replacement of the solar evaporation pans for the disposal of high TDS effluent is replaced with MEE & ATFD which is the major reason for improvement of GW quality.

CHAPTER – 5

HEALTH STATISTICS

CHAPTER - 5

HEALTH STATISTICS

5.1 Hospital Details in CEPI Area

136 nos. of bedded hospitals are functioning within the Erode CEPI core area. All the health care facilities have obtained consent of the TNPC Board. In addition there are 192 clinics, labs etc., functioning within Erode CEPI core area. All these clinics and labs have obtained one time authorisation from the Board under Biomedical Waste Management Rules 2016. The total quantity of biomedical generated within the area is collected and disposed through the Common Biomedical Waste disposal facility functioning at Edapadi, Salem District.

The details of the major hospitals within the CEPI core area is as below.

5.2 Health data of five years

The no. of patients treated in the major hospitals of Erode for the year 2012-2019 is obtained and compiled as below.

(a) M/s Sudha Hospitals, Erode.

S.No	Air Borne Diseases	No. of patients reported for the years						
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
1	Asthma	80	162	149	155	173	174	168
2	Acute Respiratory Infection	72	152	140	112	132	134	133
3	Bronchitis	90	170	130	132	141	146	144
4	Cancer	2	6	5	7	10	2	2
Total		244	490	424	406	456	456	447
	Water Borne Diseases							
5	Gastroenteritis	62	120	125	118	120	123	120
6	Diarrhea	84	119	124	125	115	118	114
7	Renal diseases	7	8	12	5	10	9	7
8	Cancer	-	-	-	-	-	-	-
Total		153	247	261	248	245	250	241

(b) M/s Lotus Hospital, Erode.

S.No	Air Borne Diseases	No. of patients reported for the years						
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
1	Asthma	-	-	-	-	-	-	-
2	Acute Respiratory Infection	43	45	51	44	-	36	33
3	Bronchitis	-	1	1	2	-	1	1
4	Cancer	-	-	-	-	-	-	-
Total		43	46	52	46	-	37	34
	Water Borne Diseases							
5	Gastroenteritis	22	31	26	26	21	22	21
6	Diarrhea							
7	Renal diseases	-	-	-	-	-	-	-
8	Cancer	-	1	-	-	1	-	-
Total		22	32	26	26	21	22	21

From the above details received from the two major hospitals functioning in the CEPI core area of Erode it is observed that the number of public/ cases affected by the air, water and land pollution has been considerably reduced. This reveals that the pollution load on environment in Erode CEPI area has been reduced.

Further, it is also informed that the Erode Industrial Cluster has been brought into the CEPI score and declared as Severely Polluted Area during 2017-18 only. The total population of Erode Corporation is 4.98 Lakhs. However the population in the Erode CEPI core area is around 3 Lakhs. The no. of cases reported during the year 2018-19 is less than the 1% of the total population in CEPI core area. Hence based on the population statistics of Erode CEPI area, the “C” factor in calculating the CEPI score is considered as “0”.

CHAPTER - 6

ACTION TAKEN

DURING 2018-19 & 2019-20

IN CEPI AREA

Chapter - 6

Action Taken during 2018-19 & 2019-20 in CEPI Area

6.1 Action taken by the industries in CEPI area for improvement of Pollution Control measures

In Erode CEPI area the predominant industrial activities are textile processing such as bleaching, dyeing and finishing of fabric. In addition tanneries about 27 nos, are function which are involved in chrome tanning process. All the textile processing and tannery units have provided individual ETP with Zero Liquid Discharge system. The treated trade effluent is reused in the process.

6.1.1 In Textile Industries

All textile processing industrial functioning within the CEPI core area have provided adequate capacity of zero liquid discharge system and the reusing the treated trade effluent in process. Necessary APC measures are provided in all the industries to control the emission from the sources during 2018-19. The operation of ZLD system and APC measures are effectively monitored by TNPCB. In addition, most of the textile processing industries have provided adequate capacity of Multiple Effect Evaporator followed by Agitated Thin Film Dryer for disposing the final reject. Some of the textile processing units have provided Low Pressure Evaporator to dispose the final reject. Hence the load on the solar evaporation pans are completely reduced thus preventing the seepage of high TDS effluent on land and substrata.

6.2 Other Initiatives in CEPI Area

The impacts due to dumping of the MSW in Vairapalayam has been considerably reduced by carrying out the biomining of the dumped legacy wastes and also the fresh wastes being dumped in the sites are completely stopped due to establishment of 19 nos of micro composting centres in all the areas of Erode Corporation. So far about 15000 T of legacy wastes has been removed in 2018-19.Also, the Erode Corporation has established and commissioned the Sewage Treatment Plant at Peelamedu Village and obtained CTO from the Board during 2019. At present, the STP is under operation and around 8 MLD of sewage (from 27 wards) is collected and treated in the STP. The total quantity of sewage generation in Erode CEPI area is around 30 MLD out which only 8 MLD is collected and treated in the STP. The rest of the untreated sewage generated in the Corporation area i.e about 22 MLD is discharged into River Cauvery. Hence directions are issued under Section 5 of

Environment (protection) Act to the Commissioner, Erode Corporation to expedite the completion of UGDSS works in remaining 33 wards so as to reduce the discharge of untreated sewage into the River.

The Erode Corporation has established and commissioned an incinerator during 2019 with a capacity to handle 55 T/day of inorganic MSW collected from the Corporation area. Hence the disposal of solid waste in the dump sites are completely eliminated and the same will be effectively implemented.

CHAPTER - 7

PROPOSED ACTION PLANS

Chapter - 7

Proposed Action Plans

7.1 Proposed Short Term Action Plans

The proposed short term action plans for the control of air pollution in the CEPI core area are as below.

7.1.1 To improve the Air Environment

Sl.No.	Improvements required	Short term Action Plan to be completed within December 2020
1.	Additional APC measures such as wet scrubbers/ bag filters/ dust collectors has to be provided for the boilers in the textile processing and tannery industries.	Additional modernised APC measures will be provided in the required industries located in the CEPI.

7.1.2 To improve the Water Environment

Sl.No	Improvements required	Short term Action Plan to be completed within December 2020
1.	Implementation of ZLDs consistently in all the textile dyeing and tanneries.	Instructing the units to revamp the existing ETP by installing MEE & ATFD to achieve ZLD consistently.

7.1.3 To improve the Land Environment

Sl.No	Improvements required	Short term Action Plan to be completed within December 2020
1.	Replacing the existing solar evaporation pans by adequate capacity of Multiple Effect Evaporator and ATFD.	To expedite the installation of adequate capacity of multiple effect evaporator followed by ATFD in textile dyeing and tanneries as per the directions/Board's Proceedings.

7.2 Proposed Long Term Action Plans

The proposed long term action plans for the control of air pollution in the CEPI core area are as below.

7.2.1 To improve the Air Environment

Sl. No.	Improvements required	Long term Action Plan
1.	To continuously monitor the quality of the existing air in CEPI core area.	Continuous Air Quality Monitoring Stations – 2 Nos. will be installed within CEPI core area in the predominant wind directions

7.2.2 To improve the Water Environment

Sl.No	Improvements required	Long term Action Plan
1.	Preventing disposal of untreated sewage into water bodies	Erode City Municipal Corporation has proposed to complete the UGDSS works in the remaining 33 wards of Erode Corporation out of the 60 wards within three years so as to prevent the disposal of untreated sewage (about 22 MLD) into River Cauvery and Kalingarayan canal.
2.	Formation of Common Effluent Treatment Plants (CETPs) to replace the existing IETPs for the textile dyeing and tannery units in CEPI area.	Expediting the installation of 5 Common Effluent Treatment Plants with ZLD treatment system within the CEPI core area with the total capacity of 22.2 MLD before 2021.

Details of the proposed CETP:

Name of the CETP	Capacity in MLD	No. of member units
M/s Green Kalingarayan CETP Pvt Ltd.,	5.80	82
M/s Villarasampatti CETP Pvt Ltd.,	4.50	85
M/s Suriyampalayam CETP Pvt Ltd.,	4.20	36
M/s Gangapuram CETP Pvt Ltd.,	6.20	38
Erode Common RMS Plant for large scale units	1.50	18

7.2.3 To improve the Land Environment

Sl.No	Improvements required	Long term Action Plan
1.	Impact of leachate generated from the Municipal Solid waste dumpsite	i. Extending the Micro composting activity covering the entire Municipal corporation area. ii. Increasing the capacity of the existing incinerator functioning at Vairapalayam to handle the entire quantity of plastic and other waste
2.	Impact of disposal of untreated sewage into water bodies and on land.	Giving direction to the Municipal Commissioner, Erode to expedite the completion of UGDSS in the remaining 33 wards of Erode Municipal corporation.
3.	Formation of Common Effluent Treatment Plants (CETPs) to replace the existing IETPs for the textile dyeing and tannery units in CEPI area.	Expediting the installation of 5 Common Effluent Treatment Plants with ZLD treatment system within the CEPI core area with the total capacity of 22.2 MLD The CETPs are expected to complete the construction, erection and commissioning of the ZLDs during 2021.

CHAPTER - 8

CEPI SCORE FOR THE POST MONSOON 2019

Chapter - 8
Evaluation of CEPI Score for Post Monsoon 2019

Air Quality Analysis Report

Pollutant	Group	A1	A2	A
PM10	B	2	Moderate	A1*A2
PM2.5	B	0.5		
NO2	A	0.25		
		2.75	2.5	6.875

Pollutants	Avg(1)	STD(2)	EF{(3)=1/2)}	No of Samples Exceeding (4)	Total No of Samples(5)	SNLF Value {(6)=4/5x3}	SNLF Score	
PM10	51.5	100	0.52	0	4	0.00	L	0
PM2.5	19.25	60	0.32	0	4	0.00	L	0
NO2	21.5	80	0.27	0	4	0.00	L	0
B = B1+B2+B3								0

C	0	<5%
D	5	A-IA-A

AIR EPI	**(A+B+C+D)**	**11.875**

Water Quality Analysis Report

Pollutant	Group	A1	A2	A
TP	B	2	Moderate	A1*A2
T.Hard	A	0.25		
TKN	A	0.25		
		2.5	2.5	6.25

Pollutants	Avg(1)	STD(2)	EF{(3)=1/2)}	No of Samples Exceeding (4)	Total No of Samples (5)	SNLF Value {(6)=4/5x3}	SNLF Score	
TP	0.135	0.3	0.45	0	7	0.00	L	0
T.Hard	182.85	600	0.30	0	7	0.00	L	0
TKN	0.5	3	0.17	0	7	0.00	L	0
B = B1+B2+B3								0

C	0	<5%
D	5	A-IA-A

WATER EPI	**(A+B+C+D)**	**11.25**

Ground Water Quality Analysis Report

Pollutant	Group	A1	A2	A
TDS	A	1	Moderate	A1*A2
TH	A	0.25		
TKN	A	0.25		
		1.5	2.5	3.75

Pollutants	Avg (1)	STD(2)	EF{(3)=1/2)}	No of Samples Exceeding (4)	Total No of Samples (5)	SNLF Value {(6)=4/5x3}	SNLF Score	
TDS	1267	2000	0.63	1	8	0.08	M	9
TH	682.5	600	1.14	5	8	0.71	H	6.25
TKN	0.5	1	0.5	0	8	0.00	L	0
B = B1+B2+B3								15.25

C	0	<5%
D	5	A-IA-A

GROUND WATER EPI	**(A+B+C+D)**	**24**

CEPI Score= **im + {(100 - im)*(i2/100)*(i3/100)}**

25.02

CHAPTER-9

CONCLUSION

CHAPTER - 9
CONCLUSION

7.1 Conclusion

The values of the air pollution load in the CPCB identified locations within Erode CEPI area is within the desirable limit which indicates that the quantum of the air pollution has been reduced in the CEPI core area. Necessary APC measures such as dust collectors, wet scrubber etc., are provided to the emission sources during 2018-19 & 2019-20 in most of the industries within CEPI area. Additional Air Pollution Control measures required in the industries located in CEPI area will be provided to further improve Air Quality in CEPI area.

Ambient air monitoring conducted during 2018 by CPCB in which four of the locations out of eight have exceeded PM10. This may be due to localised sources like construction activities, UGDSS works as well as vehicular emission. The industries sources emission load is 592 kg/day and average stack height 30m which clearly indicates the PM contribution from industrial emission sources are minimum.

During CPCB's CEPI sampling, all the surface water bodies within Erode were having lean flow and that may be due to domestic waste water. The total sewage discharged into surface water body is around 22 MLD which clearly indicates the high concentration of total phosphorous and TKN only because of sewage and not because of effluent discharge from the industries.

During 2018 sampling by the CPCB, four samples were collected from the points located far away from Erode CEPI core area i.e., more than 7 km. Hence additionally three surface water sampling points were identified within the core area and included the same in evaluation of CEPI score for 2019.

The Ground Water EPI for the samples collected by the CPCB during 2018 is found high due to the sample collected from the well located very nearer to the MSW dumpsite. Five ground water sampling locations of the bore wells located far away (6-10km) from the core area has been replaced with alternate six sampling locations in the core and impact zone. The hazardous waste generated by the textile dyeing and tanneries have been transported to cement industries for co-processing. Temporary storage of the sludge within the premises of the industry is stored in closed shed on paved platform. Hence there is no impact of leachate on ground water. Further replacement of the solar evaporation pans for the disposal of high TDS effluent is replaced with MEE & ATFD which is the major reason for improvement of GW quality.

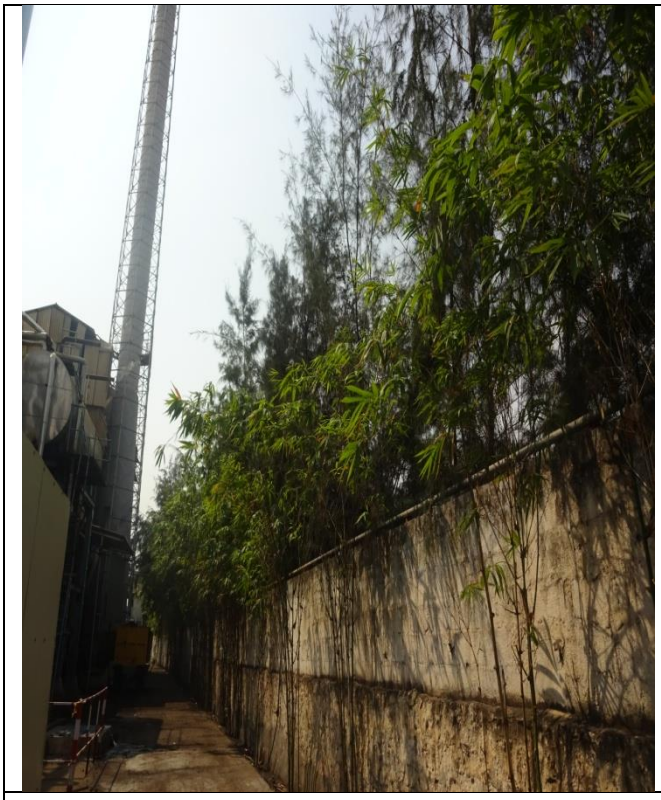
Erode has been declared as Severely Polluted Area (SPA) and has obtained CEPI score of 60.33. The short term and long term action plans furnished above will be implemented in letter and spirit to improve the quality of Air, Water and land environment to ensure peaceful living and existence of human being, plant, animal and for sustainable development. Directions for closure and disconnection of power supply will be issued to the violating industries. Environmental compensation fund will be collected from the defaulting industries. The compensation thus collected will be utilized for the improvement of the environment and restoration of damages caused to the Environment.

From the study conducted during 2018 by the CPCB the CEPI score for Erode CEPI area as per the revised guidelines is 60.33 (Air- 34.12 , Water- 47, Land – 52.75 i.e., An- Wn-Lc). The TNPCB has taken various measures during 2018-19 & 2019-20 for the effective implementation of Zero Liquid Discharge system, biomining of MSW legacy waste, Micro composting activities at 19 locations, incineration of MSW non biodegradable waste, treatment of part of domestic sewage through the existing Corporation STP has improved the environmental quality. Further, the proposed four Common Effluent Treatment plants for the existing textile dyeing and bleaching industries with adequate individual effluent treatment plants (after the formation of the CETPs, the IETPs will be closed) and the proposed solar energy plants for the CETPs will reduce the burden on the environment and the CEPI score will considerably reduced to the expected level of 25.02.

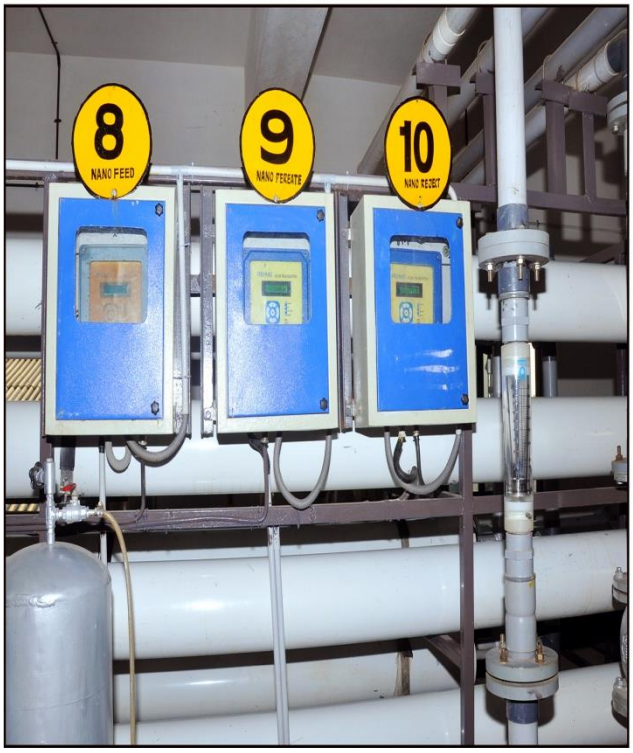
Annexure-A4

Photographs showing the green belts developed by the major industries

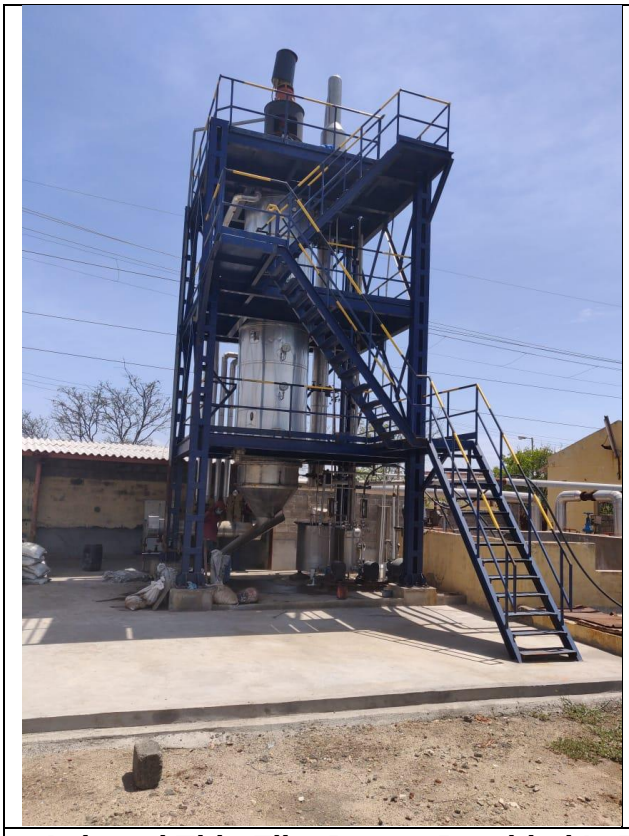
Green Belt development by the industries

	
Green Belt Development by Industries	

Photographs showing the improvement measures made in the industries during 2018-19 & 2019-2020



R.O & Multiple Effect Evaporators installed in Dyeing industries

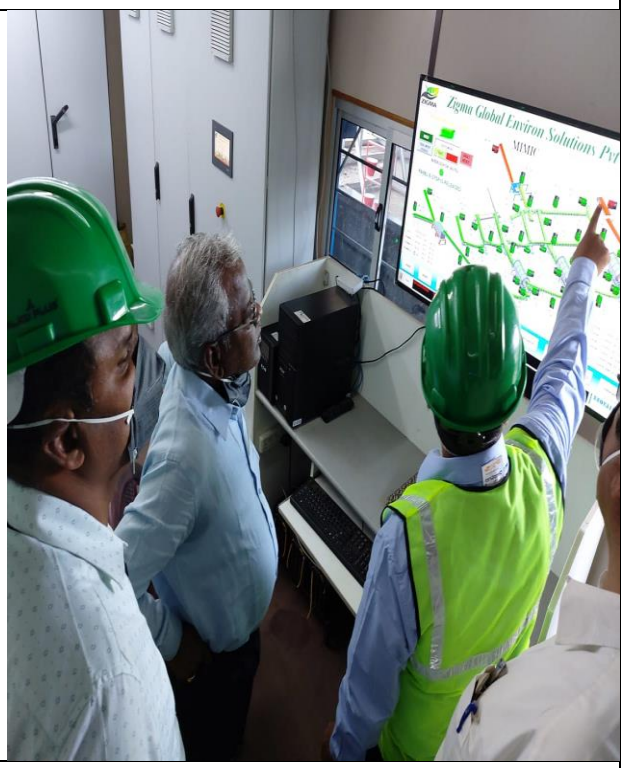


Agitated Thin Film Dryers Provided In Textile Processing Units To Dispose The Final Rejects

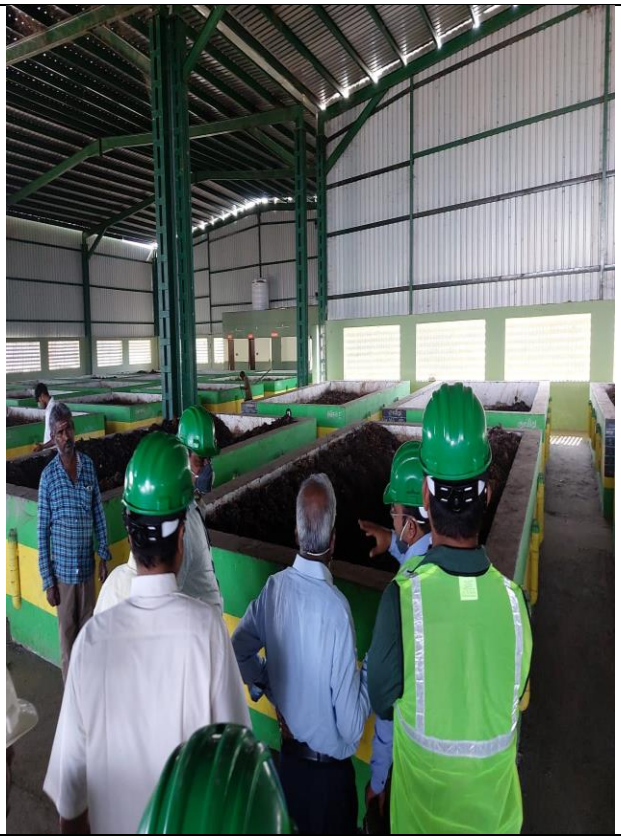
Low Temperature Evaporator installed by the Textile Processing Units

MVRE installed by the industries

SCADA for MVRE



Bio-mining of the Legacy waste at Vairapalayam is carried out



Micro Composting Centres Established to Handle MSW in CEPI Area

Erode City Municipal Corporation MSW dumpsite at Vairapalayam

Incinerator for MSW functioning at Vairapalayam, Erode

Annexure-A5

AMBIENT AIR QUALITY SURVEY REPORT -2019

Parameters	Vendipalayam	Vairapalayam	Karuvilparaivalasu	Chitthode	Mean Concentration	NAAQS*	Units
Particulate Matter ($PM_{2.5}$)	18	23	16	20	19.25	60	µg/m³
Particulate Matter (PM_{10})	50	59	48	49	51.5	100	µg/m³
NO_2	21	23	22	20	21.5	80	µg/m³

SURFACE WATER QUALITY REPORT-2019

S.NO	PARAMETERS	UNITS	Sampling location & Results							Mean Concentration	CPCB Water Quality Requirements Standards MINARS - 17/2001-02
			Cauvery River at NTADCL	Cauvery River at Vendipalayam	Kalingarayan at NTADCL	Kalingarayan at Vendipalayam	Kalingarayan at B.P Agraharam	Cauvery at Agraharam Barrage	Karuvilparaivalasu Tank		
1	**Total Hardness**	mg/l	240	120	240	210	88	130	252	182.85	600
2	**Total Phosphorous**	mg/l	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL DL: 0.05	0.28	0.27	0.30	0.135	0.30
3	**TKN**	mg/l	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	0.5	3.0

GROUND WATERQUALITY REPORT-2019

S. No	Parameter	Unit	Sampling Locations & Results								Mean Concentration	IS 10500 Drinking water Standards
			Open well at Vendi Palayam	Bore well at Vairapalayam	Borewell at Moolapalayam	Bore well at Villarasampatti	Borewell at Sellappampalayam	Bore well at B.P Agraharam	Public Bore well at Kasipalayam	Bore well at Karugalpalayam		
1	**TDS**	mg/l	4190	1328	947	210	852	1183	173	1253	1267	2000
2	**Total Hardness**	mg/l	1520	760	720	160	740	460	480	620	682.5	600
3	**TKN**	mg/l	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	BDL (DL: 1.0)	0.5	1

CEPI Calculation of Erode SPA

Comprehensive Environmental Pollution Index (CEPI) Working Sheet as per revised Formula given by CPCB Vide Lr No. B-29012/ESS (CPA)/2015-16/ Dated 26.4.2016

Hazard = Pollutant Source, Pathway and Receptor

1. Air Environment:

A: Source:

Factor A1- Presence of Toxins:

1. ***Criteria pollutants:*** **PM10**

Pollutant	Measured Mean Concentration	Score
Group-B – PM 10	51.5 µg/m3	2
Score of Criteria Pollutant = Maximum Score of criteria pollutant (2)		**2**

2. ***Secondary Pollutants:*** **(PM2.5, NO_2)**

Group-B–PM2.5(Pollutant that are probable carcinogens)	19.25 µg/m3	0.5
Group-B– NO_2 (Pollutant that are probable carcinogens)	21.5 µg/m3	0.25
Score of secondary pollutant = Sum of all sec. pollutant score		**0.75**

A1 = Criteria pollutant score + Secondary pollutant score =		**2.75**

Factor A2- Scale of industrial activities:

Erode CEPI Industrial Cluster: No 17 Category Large size units are located in the core industrial cluster & 7 Nos. of Red Large Category units & more than 500 Nos. of Red small Category units are located		
A2 (As per guideline) =		**2.5**

Score A = A1 x A2 =		**6.87**

B: Pathway:

1. **Primary Pollutants:**

Level of Exposure is to be calculated using SNLF and the value given Table. SNLF refers to Surrogate number.

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor) Exceedance Factor = Observed mean concentration of pollutant/Standard ***1. Primary Pollutant: -*** **PM_{10}**

PM_{10}: Observed Mean concentration (µg/m^3) = 24 hrs Average	51.5	-
PM_{10}: Standard (µg/m^3) Annual Average	100	-
PM_{10}: Exceedance Factor = (Observed concentration of pollutant/Standard)	0.515	-
No. of samples exceed the standard =	0	-
Total no. of samples =	4	-
SNLF (PM_{10}) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0**	**-**

EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PM_{10}: Moderate, Value (From Table) = 0		**0**

Contribution of Primary Pollutant = B1 = Maximum Score of criteria pollutant	**0**

2. ***Secondary Pollutants:***

Secondary Pollutant: - **$PM_{2.5}$**

$PM_{2.5}$: Observed mean concentration (µg/m^3) =	19.25	-
$PM_{2.5}$: Standard (µg/m^3)=	60	-
$PM_{2.5}$: Exceedance Factor= Observed mean concentration of pollutant/Standard	0.32	-
$PM_{2.5}$: No. of samples exceed the standard =	0	-
Total no. of samples =	4	-
SNLF ($PM_{2.5}$) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0**	-
EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PM_{10}: Low, Value = 0		**0**

Secondary Pollutant: NO_2

NO_2: Observed mean concentration (µg/m^3) =	21.5	-
NO_2: Standard (µg/m^3)=	60	-
NO_2: Exceedance Factor =	0.35	-
Total no. of samples =	4	-
NO_2: No. of samples exceed the standard =	0	-
SNLF (*NO_2*) = (No.of samples exceed / total No. of samples) X (Exceedance factor)	**0**	-

EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PM2.5: Low, Value =		**0**

Contribution of Secondary Pollutant Sum of the score of secondary pollutants = B2	**0**

B = B1 + B2 =	**0**

C: Receptor:

It is relevant to Impact on Human Health - Based on the previous 5 years' records of 3-5 major hospitals of the area. For Air Environment, total no. of cases related to Asthma, Bronchitis, Cancer, Acute Respiratory infections etc are to be considered. The values are taken from the Table given by CPCB	
For Erode CEPI industrial Area, from the health data C value is taken as = 0 i.e increase is <5%	**0**

D: Additional High Risk Element:

All large industries in the area have adequately designed/ operated and maintained Pollution control facilities but medium and small industries are defaulting	
Hence D (From CPCB Guidelines) =	**5**

Sub-Index Score (Air) = (A+B+C+D) =	**11.87**

2. Water Environment:

Surface Water Source taken up for study: River Cauvery, Kalingaryan canal and Karuvilparaivalasu Tank.

A: Source:

Factor A1- Presence of Toxins:

1. ***Criteria pollutants:*** **- (Total Phosphorous)**

Pollutant	Measured Mean Concentration	Score
Group A - Total Phosphorous (Pollutant not assessed as acute or systemic)	0.135	2
Score of Criteria Pollutant = Maximum Score of criteria pollutant (1)		**2**

2. ***Secondary Pollutants: -*** **(Total Hardness and TKN)**

Pollutant	Measured Mean Concentration	Score
Group-A – Total Hardness (Pollutant not assessed as acute or systemic)	182.85 mg/l	0.25
Group A – TKN (Pollutant not assessed as acute or systemic)	0.5 mg/l	0.25
Score of secondary pollutants = sum of score of sec. pollutants =		**0.5**

A1 = Criteria pollutant score + Secondary pollutants score =		**2.5**

Factor A2- Scale of industrial activities:

Erode CEPI Industrial Cluster: No 17 Category Large size units are located in the core industrial cluster & 7 Nos. of Red Large Category units & more than 500 Nos. of Red small Category units are located		
A2 (As per guideline) =		**2.5**

Score A = A1 x A2 =		**6.25**

B: Pathway

1. **Primary Pollutants:**

1.1 Primary Pollutant: - **Total Phosphorous**

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Total Phosphorous: Observed Mean Concentration (mg/L) =	0.135	-
Total Phosphorous: Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series; MINARS/17/2001-2002)	0.3	-
Total Phosphorous: Exceedance Factor =	0.45	-
Total Phosphorous: Total no. of samples =	7	-
Total Phosphorous: No.of samples exceed the standard =	0	-
SNLF (Total Hardness) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=	**0**	-

EF < 0.45, SNLF = 0. Hence the Level of exposure Category of Total Hardness: Low, Value = 0		**0**

Contribution of Primary Pollutant = B1 = Maximum Score of criteria pollutant (0)	**0**

2. **Secondary Pollutant:**

Secondary Pollutant: - **Total Hardness**

Total Hardness: Observed Mean Concentration (mg/L) =	182.85	-
Total Hardness (mg/L) : Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series; MINARS/17/2001-2002)	600	-
Total Hardness: Exceedance Factor =	0.30	-
Total Hardness: Total no. of samples =	7	-
Total Hardness: No. of samples exceed the standard =	0	-
SNLF (Total Phosphorous) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=	**0**	-

EF 0.30, SNLF = 0. Hence the Level of exposure Category of Total Phosphorous: LOW, Value = 0		**0**

Secondary Pollutant:* - *TKN

TKN: Observed mean concentration (mg/L) =	0.5	-
TKN (mg/L) : Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series; MINARS/17/2001-2002)	3	-
TKN: Exceedance Factor	0.16	-
Total no. of samples =	7	-
TKN: No.of samples exceed the standard =	0	-
SNLF (TKN) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0**	-

EF 0.16, SNLF = 0. The Level of exposure Category of BOD: LOW, Value = 0		**0**

Score of Secondary pollutants = sum of score of secondary. pollutants = B2	**0**

B = B1 + B2 =	**0**

C: Receptor:

It is relevant to Impact on Human Health - Based on the previous 2 years records of the major hospitals of the area. For water Environment, total no. of cases related to Gastroenteritis, Diareah, Renal diseases etc. are to be considered. The values are taken from the Table given by CPCB	
For Erode Severely Polluted Area, the C value is taken as = 0 i.e increase is < 5%	**0**

D: Additional High Risk Element:

All large industries in the area have adequately designed/ operated and maintained Pollution control facilities but medium and small industries are defaulting	
Hence D (From CPCB Guidelines) =	**5**

Sub-Index Score (Water) = (A+B+C+D) =	**11.25**

3. **Land Environment:**

Ground Water Quality is considered to represent Land Environment

A: Source:

Factor A1- Presence of Toxins:

1. ***Criteria pollutants:*** **- (Total Dissolved Solids)**

Pollutant	Measured Mean Concentration	Score
Group A-Total Dissolved Solids (Pollutant not assessed as acute or systemic)	1267 mg/l	1.0
Score of Criteria Pollutant = Maximum Score of criteria pollutant (1)		**1.0**

2. ***Secondary Pollutants: -*** **(Total Hardness, TKN)**

Pollutant	Measured Mean Concentration	Score
Group-A – Total Hardness (Pollutant that are probable carcinogens)	682.5	0.25
Group A – TKN (Pollutant not assessed as acute or systemic)	0.50	0.25
Score of secondary pollutants = sum of score of sec. pollutants =		**0.5**

Score A1 = (sum of score of Primary pollutant and secondary pollutants)		**1.5**

Factor A2- Scale of industrial activities:

Erode CEPI Industrial Cluster: No 17 Category Large size units are located in the core industrial cluster & 7 Nos. of Red Large Category units & more than 500 Nos. of Red small Category units are located		
A2 (As per guideline) =		**2.5**

Score A = A1 x A2 =		**3.75**

B: Pathway

1. Primary Pollutants:

1.1 Primary Pollutant: - **Total Dissolved Solids**

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Total Dissolved Solids: Observed Mean Concentration =	1267	-
Total Dissolved Solids: Standard :	2000	-
Total Dissolved Solids: Exceedance Factor =	0.64	-
Total Dissolved Solids: Total no. of samples =	8	-
Total Dissolved Solids: No. of samples exceed the standard =	1	-
SNLF (Total Dissolved Solids) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=	**0.08**	-

EF 0.64 SNLF = 0.08 Hence the Level of exposure Category of Total Dissolved Solids: Moderate, Value = 9		**9**

Max contribution of Primary Pollutant = B1	**9**

2. Secondary Pollutant:

Secondary Pollutant: - **Total Hardness**

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Total Hardness: Observed Mean Concentration =	682.5	-
Total Hardness: Standard : Standard IS: 10500-1991 (mg/L) =	600	-
Total Hardness: Exceedance Factor =	1.14	-
Total Hardness: Total no. of samples =	8	-
Total Hardness: No. of samples exceed the standard =	5	-
SNLF (Total Hardness) = (No. of samples exceed / total No. of samples) X (Exceedance factor)=	**0.71**	-

SNLF = 0.71 Hence the Level of exposure Category of Total Hardness: High, Value = 6.25		**6.25**

Secondary Pollutant: **- TKN**

TKN Observed Mean Concentration(mg/L)=	0.50	-
TKN: Standard IS: 10500-1991 (mg/L) =	1.0	-
TKN: Exceedance Factor =	0.5	-
TKN: Total no. of samples =	8	-
TKN: No. of samples exceed the standard =	0	-
SNLF (TKN) = (No. of samples exceed / total No. of samples) X (Exceedance factor) = 0	**0**	-

SNLF = 0 . Hence the Level of exposure Category of TKN: Moderate, Value = 3.5		**0**

Score of Secondary pollutants = sum of score of secondary. pollutants = B2	**6.25**

B = B1 + B2 =	**15.25**

C: Receptor:

It is relevant to Impact on Human Health - Based on the previous 5 years' records of the major hospitals of the area. For land Environment, total no. of cases related to Gastroenteritis, Diareah, Renal diseases etc.. are to be considered. The values are taken from the Table given by CPCB	
For Erode CEPI area, the C value is taken as = 0 i.e increase <5%	**0**

D: Additional High Risk Element:

All large industries in the area have adequately designed/ operated and maintained Pollution control facilities but medium and small industries are defaulting	
Hence D (From CPCB Guidelines) =	**5**

Sub-Index Score (Land) = (A+B+C+D) =	**24**

Aggregated CEPI Score:

$$CEPI = im + [(100-im) *(i2/100) *(i3/100)]$$

Where,
im: maximum sub index; and i2 and i3 are sub-indexes for other media

Sub-Index of Air = 11.85, Sub-Index of Water = 11.25, Sub-Index of Land = 24

Hence i_m	=	24
CEPI	=	25.02
CEPI Score of Erode Industrial Cluster	**=**	**25.02**

001417

MINUTES OF THE COMMITTEE MEETING CONSTITUTED FOR CEPI ACTION PLAN OF ERODE INDUSTRIAL CLUSTER LOCATED IN TAMILNADU HELD ON 09.01.2020 IN THE CHAMBER OF PRINCIPAL SECRETARY ENVIRONMENT & FORESTS DEPARTMENT, SECRETARIAT, CHENNAI.

Present:

1. Thiru. Shambhu Kallolikar I.A.S.,
   Principal Secretary to Government,
   Environment & Forests Department, Secretaraiat, Chennai.

2. Thiru. A.V.Venkatachalam, I.F.S,
   Chairman,
   Tamil Nadu Pollution Control Board, Chennai.

3. Dr. S.Selvan
   Chief Environmental Engineer,
   Tamil Nadu Pollution Control Board, Chennai.

4. Dr. A.Viswanathan, JD (Acts)
   O/o the Directorate of Medical & Rural Health Services.

5. Tmt.H.Prabhavathy, GM (PI) i/c
   Representative of State Industries Promotion Corporation of Tamilnadu (SIPCOT).

6. Thiru.A.Sohail Ahmed,
   Technical Expert (GP), O/o Chief Engineer, PWD, W.R.O.,
   State Ground & Surface Water Resources Data Centre,
   Taramani, Chennai – 600 113.

7. Other TNPCB Officials.

The Chief Environmental Engineer, Tamil Nadu Pollution Control Board welcomed the committee members and officials of TNPCB and briefed about the new CEPI methodology adopted by CPCB.

Dr.S.Suresh Kumar from G lens Innovations Labs Pvt Ltd on behalf of AC Tech, Chennai (hired as third party by TNPCB for analysis and assessment of CEPI – post monsoon 2019) detailed the the concept of CEPI

and briefed about the individual CEPI scores of CPCB in 2018 in Tamilnadu and the present post monsoon scores in 2019 with regard to Air, Water and Land Environment in the 8 industrial clusters of Vellore, Manali, Coimbatore, Erode, Mettur, Tuticorin, Tiruppur, and Cuddalore.

With regard to Erode CEPI area, Dr.S.Suresh Kumar briefed the following

1. The CEPI scores for the last two periods are as follows

Period	**CEPI Score**
CEPI Score 2019	25.02
CEPI Score 2018	60.33

2. In the aggregated CEPI score of 2018, it has been reported that the Sub Index values for Air is 34.13, Water is 47.0 and Land is 52.75, thus the CEPI score was **60.32**, whereas in the present aggregated CEPI score during 2019 for the Sub Index values for Air is 11.87, Water is 11.25 and Land is 24.0, thus the CEPI score has reduced to **25.02**.
3. It has been distinguished for the high CEPI score in 2018 and for low CEPI score in 2019.

   The main reasons attributed for high CEPI score include,

   a. Out of 8 AAQM locations, 4 locations are outside the core area.
   b. PM10 exceeded in few of the locations due to construction activities, UGDSS works as well as vehicular emission.
   c. Out of 7 SW samples almost all parameters were well below within the limit except Total Phosphorous which exceeded in few of the locations. Out 7 SW samples 4 are 7km away from the core industrial area.
   d. 22 MLD of sewage is discharged into the surface water bodies, which attributes to high concentration of total phosphorous and TKN. Thus, high concentration of total phosphorus and TKN is

due to sewage and not because of effluent discharge from the industries

e. Nine ground water sample locations were selected around the CEPI area, out of which 5 samples are 6 – 10 km away from industrial area.

f. One of the ground water samples collected is just 50 M from MSW dumpsite which gives very high concentration.

The main reasons for less CEPI score in 2019 include,

i. Now the PM10 and PM2.5 were reduced, since all localized activities have been completed.

ii. All industries have provided proper APCD (dust collectors, wet scrubbers etc) and the same are monitored through online monitoring system.

iii. Total quantity of trade effluent generation is 48.58 MLD, of which 46.9 MLD is treated and reused by ZLD. The balance quantity of 1.68 MLD is treated by IETP and there is no discharge of effluent outside.

iv. STP has been provided for a capacity of 50.5 MLD and with the completion of UGDSS in 25 wards, 28.55 MLD is treated in the STP. Implementation of UGDSS in the remaining 33 wards is in progress.

v. Biomining of MSW legacy waste.

vi. Micro composting activities at 19 locations.

4. To the queries raised by the Principal Secretary, it was clarified that the critical parameters and locations identified by CPCB during 2018 was also followed while sampling during 2019. Representative of Chief Engineer, PWD, W.R.O. wanted to know whether other parameters could be included for CEPI assessment, for which it was replied that the protocol followed by CPCB had to be adopted for harmonious CEPI calculation every year. To the representative of Director of Medical & Rural Health Services, it was clarified that as per the direction issued

by CPCB on 26.04.2016, the air and water borne diseases to be considered in the health data are Asthma, Bronchitis, Cancer, Acute respiratory infections, Gastroenteritis, Diarrhea, renal (kidney) malfunction cancer etc

5. After detailed discussion the committee members decided to approve the CEPI action Plan prepared for Erode Industrial cluster in Tamil Nadu and to submit to CPCB, New Delhi

With the above, the meeting came to an end.

S.No.	Members	Signature
1.	Thiru. Shambhu Kallolikar IAS., (Chairman of Committee) Principal Secretary to Government, Environment & Forests Department	
2.	Member Secretary, Tamilnadu Pollution Control Board, Chennai	
3.	Director of Medical & Rural Health Services	
4.	Representative of State Industries Promotion Corporation of Tamilnadu (SIPCOT)	
5.	Chief Engineer, PWD, W.R.O., State Ground & Surface Water Resources Data Centre, Taramani, Chennai – 600 113	